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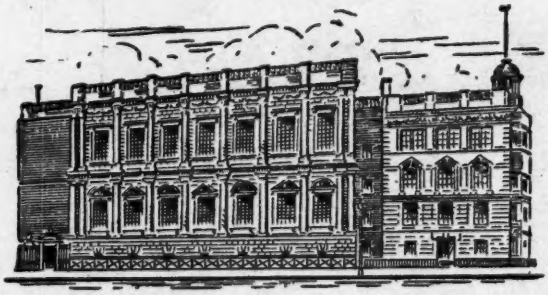

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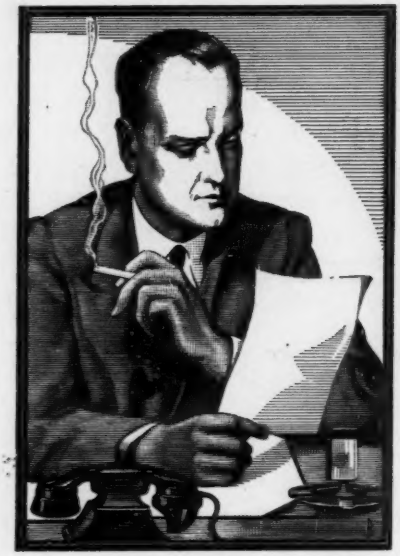

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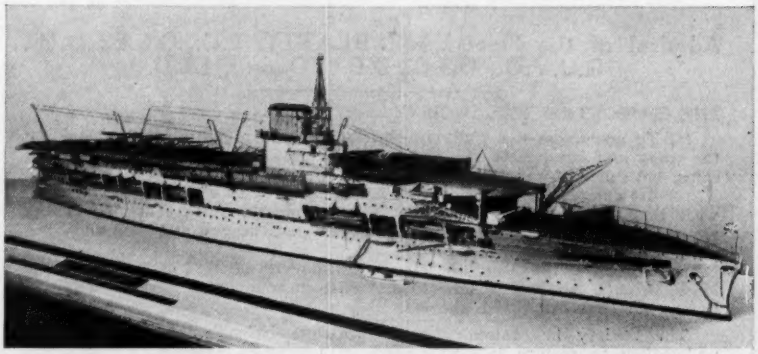

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The following Loyal Address was sent through the Home Secretary to His Majesty the King on the occasion of his Silver Jubilee :—

MAY IT PLEASE YOUR MAJESTY

The Chairman, Council, and Members of the Royal United Service Institution with humble duty to Your Majesty beg leave to offer their loyal congratulations on the completion of the twenty-fifth year of Your Majesty's reign.

This Institution is composed of those who have the honour of holding Your Majesty's Commission and they take this opportunity of re-affirming their devotion to Your Throne and Person.

The Institution has been honoured by Your Majesty's patronage and by the personal visits and gifts both of Your Majesty and Her Majesty the Queen.

They trust that Your Majesty may long be spared to exercise the wise and beneficent rule which Your Majesty's subjects have so long been privileged to enjoy.

I remain, with the profoundest veneration, Your Majesty's most faithful subject and devoted servant,

(Signed) W. E. GOODENOUGH, Admiral,
Chairman of the Council.

To The King's Most Excellent Majesty.

Chairman of the Council

Admiral Sir W. E. Goodenough, G.C.B., M.V.O., has been elected Chairman of the Council for the year 1935–1936.

Vice-Chairman of the Council

General Sir Felix Ready, K.C.B., C.S.I., C.M.G., D.S.O., has been elected Vice-Chairman of the Council for 1935–1936.

New Members

The following officers joined the Institution during February, March and April :

ROYAL NAVY

Captain G. G. Thorne, R.D., R.N.R.
Commander C. H. Williams, R.N.R.
Lieutenant-Commander G. T. A. Scott, R.N.
Lieutenant C. R. Hardy, Royal Marines.
Lieutenant D. F. Townsend, R.N.
Lieutenant J. B. E. Wainwright, R.N.
Lieutenant C. F. Phillips, Royal Marines.
Captain A. G. Tippet, D.S.O., R.N.
Lieutenant-Commander St. J. A. D. Garniss, R.I.N.
Lieutenant (E) F. H. Phillips, R.N.
Acting Sub-Lieutenant J. R. L. Moore, R.N.
Sub-Lieutenant P. C. S. Black, R.N.
Acting Sub-Lieutenant C. P. Mills, R.N.
Commander Q. H. Paterson, D.S.C., R.N.
Rear-Admiral P. L. H. Noble, C.B., C.V.O.

Lieutenant W. D. F. B. Muspratt, R.N.
Lieutenant J. H. McCahon, Royal Marines.
Midshipman R. H. P. Carver, R.N.

ARMY

Lieutenant J. G. Vyvyan, The Royal Welch Fusiliers.
Lieutenant-Colonel M. B. Savage, C.B.E., D.S.O.
2nd Lieutenant W. B. R. Neave-Hill, The East Yorkshire Regiment.
Lieutenant-Colonel Lewis A. Allen, D.S.O., T.D.
2nd Lieutenant E. H. Gibbon, Royal Tank Corps.
2nd Lieutenant C. T. Honeybourne, Royal Corps of Signals.
2nd Lieutenant T. P. D. Spens, The Argyll & Sutherland Highlanders.
Captain F. H. Stevens, 6th Rajputana Rifles.
2nd Lieutenant D. A. Jebb, The Cameronians (Scottish Rifles).
2nd Lieutenant P. F. Fane Galdwin, Scots Guards.
2nd Lieutenant R. E. L. Harvey, Scots Guards.
2nd Lieutenant D. H. A. Kemble, Scots Guards.
Captain A. E. Snow, The Somerset Light Infantry.
Lieutenant A. G. Walch, The Loyal Regiment.
Captain R. J. Tuke, late The Buffs.
2nd Lieutenant H. L. Westmorland, 3rd The King's Own Hussars.
2nd Lieutenant P. E. Webb, 4th/7th Dragoon Guards.
Lieutenant P. D. Clendenin, late The Gordon Highlanders.
2nd Lieutenant J. H. Busby, The Beds and Herts Regiment.
2nd Lieutenant W. S. Capper, Royal Artillery.
Lieutenant J. R. Durham-Matthews, Irish Guards.
Lieutenant C. R. Price, Royal Engineers.
Lieutenant J. B. Robertson, Royal Tank Corps.
Colonel F. C. L. Hulton, C.B., late 1st Dragoon Guards.
2nd Lieutenant R. M. P. Carver, Royal Tank Corps.
Lieutenant R. P. de Winton, Royal Artillery.
2nd Lieutenant J. H. Walcot, The King's Shropshire Light Infantry.
Major B. MacMahon Mahon, D.S.O., M.C., The Scinde Horse.
Lieutenant E. A. F. Macpherson, The Argyll and Sutherland Highlanders.
2nd Lieutenant G. Dunbar Moodie, S.A. Ordnance Corps.
Captain C. M. Smith, D.S.O., R.A.S.C.
Lieutenant I. A. D. Banks, Royal Tank Corps.
Major E. G. Earle, D.S.O., Royal Artillery.
Lieutenant E. Warrington Lloyd, 1st City of London Regiment (Royal Fusiliers).
Lieutenant Gurdial Singh, 1st Battn. 7th Rajput Regiment (Q.V.O.L.I.).
Lieutenant Prithvi Jeet Singh, 1st Battn. 7th Rajput Regiment (Q.V.O.L.I.).
2nd Lieutenant J. C. M. Morton-Clarke, The Royal Berkshire Regiment.
2nd Lieutenant T. G. H. Kirkwood, Royal Engineers.
Lieutenant M. P. Huthwaite, The Loyal Regiment.
2nd Lieutenant W. A. McL. Bradley, 3/20th Burma Rifles.
Lieutenant-Colonel C. D'A. Bingham, 5th Mahratta Light Infantry, I.A.
Lieutenant Y. S. Paranjpe, 16th Light Cavalry, att. I.A.S.C.
2nd Lieutenant M. A. Latik-Khan, 1st Battn. 7th Rajput Regiment (Q.V.O.L.I.).
2nd Lieutenant R. E. R. Robinson, The Devonshire Regiment.
Captain R. Peake, The Royal Dragoons.

ROYAL AIR FORCE

Flight-Lieutenant H. W. Penney, R.A.F.
Flight-Lieutenant L. M. Hilton, D.F.C., A.F.C., R.A.F. (retired).
Squadron Leader O. E. Carter, A.F.C., R.A.F.

CIVILIAN MEMBER

H. Harris Brown, Esq.

Gold Medal Essay Subject (Air) 1935

The following subject has been selected :—

" Discuss the effect of the development of air power on British interests in the Mediterranean, and suggest how these interests should be protected."

For particulars of the Competition apply to the Secretary.

Office to Let

A small office on the top floor of the Institution can be let to an approved tenant. Application should be made to the Secretary.

EARDLEY-WILMOT MEDAL COMPETITION

The first competition for the Gold Medal instituted by the late Rear-Admiral Sir Sydney M. Eardley-Wilmot is now open.

The Medal will be awarded for the best essay contributed by a Member of the Institution on :—

" Changes in Naval Warfare owing to New and Modified Weapons."

Essays must be typed in triplicate, and each copy must be clearly marked " Eardley-Wilmot Competition " on the outside. Care should be taken to avoid confidential matter. When a reference is made to any work, the title of such work must be quoted.

Essays must be strictly anonymous and each must have a Motto, which must be written on the outside of each copy. They must be accompanied by a sealed envelope with the Motto written on the outside, and the competitor's name inside.

All essays must be sent by registered post, addressed to the Secretary, Royal United Service Institution, Whitehall, London, S.W.1, and must reach the Institution not later than the 15th November, 1935.

Any essay written by a serving officer will be submitted for official sanction before it is published.

All essays submitted for this competition will become the absolute property of the Council.

MUSEUM

Gift of H.M. the Queen

The Queen has presented three pinchbeck coins struck to commemorate the death of the Duke of Wellington.

Flood-Lighting of the Banqueting House

Through the courtesy of Messrs. Allom Bros., who were responsible for the flood-lighting of the Rubens Ceiling, and by arrangement with H.M. Office of Works, the Banqueting House was flood-lit during Jubilee Week.

Jubilee Exhibitions

Navy.—There are now showing a set of photographs of all the ships in which H.M. The King served ; a series of models depicting the development of the battleship during the past twenty-five years ; also miniature models showing typical units of the fleet during the same period.

Army.—A Special Exhibition depicting " The Mechanized Army in Miniature " is now on view. This represents units of Base Headquarters, a Base Camp, the Forward Area, and the Battle Area. The models and personnel have been lent from his collection by Mr. A. Leicester Hewitt.

Air Force.—A series of scale models of aeroplanes show the development of Service aircraft during the past twenty-five years. They are grouped in four dioramic settings depicting Sea Aircraft, Army Co-operation Types, Fighters, and Bombers.

Additions

(8759) Officer's belt buckle—Cameronians.—Presented by Lieut.-Colonel H. M. Lawrence.

(8760) Specimen of a 10/- Turkish note as issued for payment of the troops in Gallipoli.—Presented by Lieut.-Colonel The Rev. T. Ormsby.

(8761) Collection of buckles and badges.—Presented by Colonel S. J. Jervis.

(8763) Set of 22 Austrian badges, as worn during the Great War.—Presented by Herr Rudolph Stern.

(8764) Collection of badges and buttons of the Ceylon Mounted Rifles and Ceylon Planters' Rifle Corps.—Presented by Captain E. Collins.

(8765) Model of a Handley Page " Heyford " night bomber.—Presented by Handley Page, Ltd.

(8766) Coloured prints by Baxter of Queen Victoria, Prince Consort, Nelson and Napoleon.—Presented by Colonel F. D. Samuel.

(8767) Collection of model soldiers showing full dress uniforms worn in the British Army in 1914.—Presented by P. D. Clendenin.

(8768) Set of oleographs of the German-Austro War, 1866.—Presented by Major F. Swaine.

(8769) Lancer Cap, City of London Imperial Yeomanry.—Presented by Major S. Lambert.

(8770) Medal struck to commemorate Napoleon's surrender to H.M.S. " Bellerophon."—Presented by T. Cooper Rogerson.

(8771) Full dress uniform, Canadian Corps of Guides, 1900.—Presented by Mrs. Barber.

(8772) Stop watch with device for measuring maps and the distance of an explosion, period of the Franco-Prussian War.—Presented by Colonel E. Jennings.

(8773) Officer's belt buckle, R.A., 1880–1890.—Presented by Miss M. Le Mottee.

(8774) Three pinchbeck coins commemorative of the death of the Duke of Wellington.—Presented by H.M. Queen Mary.

(8775) Officer's shako and tunic, 59th Regiment, 1844–55.—Presented by E. L. Farman.

(8776) Model showing Guard Mounting at the Horse Guards.—Presented by W. Lockwood.

Attendance

The amount taken for admission during the past quarter was :—

£52 12s. 6d. in February.
£53 15s. 0d. in March.
£198 3s. 6d. in April.

Purchase Fund

This fund has been opened to assist in the purchase of new exhibits. The Council hope it will receive the support of Members interested in the Museum.

QUEEN VICTORIA'S CORONATION REVIEW

HYDE PARK, 9th JULY, 1838

From an Old Engraving in the Royal United Service Institution

THE JOURNAL
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Royal United Service Institution

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[Authors alone are responsible for the contents of their respective Papers. All communications (except those for perusal by the Editor only) should be addressed to the Secretary, Royal United Service Institution.]

THE KING'S NAVAL CAREER

By COMMANDER CHARLES N. ROBINSON, R.N.

HIS MAJESTY KING GEORGE V has been called the Sailor King, and certainly no monarch has better deserved that appellation, for not only has he served in all the grades open to a naval officer from Cadet to Captain, carrying out strictly the duties of each post, but he has, both during his time on active service and since, exhibited the keenest interest in and an intimate knowledge of all that appertains to the sailor's calling. This regard for the seaman's welfare is born of the days when he learnt during perils and discomforts afloat what manner of life the sailor leads. His Majesty's detailed knowledge of the material of the Navy and of questions affecting its efficiency is the outcome of his studies and service as an officer in the old "Britannia," at the Royal Naval College, Portsmouth, and other training establishments.

When, as Prince George, he entered the Navy in 1877, the era of oak, hemp, and canvas had not yet passed away. In fact, the internal organization of the Service still bore many traces of that which had obtained at the time of Trafalgar. Although radical changes had taken place in the weapons carried by the ships, in many aspects the old fighting methods survived. Smooth-bore guns were in use, and boarding pikes and tomahawks were still issued at "general quarters." The King's experience and knowledge of the Navy goes back over a period of nearly sixty years, and may be said to be coincident with the transformation which has come over naval architecture and ship design since the introduction of shell-fire obliged ships to become armoured.

It is of interest to note that he served in the " Northumberland," laid down in 1861, one of the very first of the ironclad frigates of the period of the " Warrior " and " Black Prince " classes ; in the " Alexandra," which was the last of the fully-masted central battery ironclads ; and in the " Dreadnought," one of the first of the turret ironclads with the coming of which masts and sails were definitely abandoned.

In later years, during frequent visits to the fleet, His Majesty has made himself acquainted with the most modern vessels and the latest developments of offensive and defensive powers. It is a matter of historic interest that he led to sea for exercises in July, 1914, just prior to the War, the mightiest naval force ever known in the world's history. It is natural that the King, both by virtue of his office and his service, should realize what the Navy has meant and still means to his people and Empire, and he has often shown his appreciation of all that appertains to its past history. Especially was this manifested when, on 17th July, 1928, he set the seal of Royal approval on the work of restoring H.M.S. " Victory " at Portsmouth by inspecting her in her new home and unveiling a commemorative tablet.

Prince George and his brother, the late Duke of Clarence and Avondale, entered the training ship " Britannia " on 5th June, 1877. The " Britannia " of that date was not the original training ship for Cadets inaugurated in 1859, but the vessel which replaced her in 1869, and in which for some forty years, until the erection of the present Naval College, Cadets were trained in Dartmouth harbour. The " Britannia " which the young Princes joined had been begun as a sailing three-decker in 1848. She was lengthened while still on the stocks, and launched as a screw ship of the line of 131 guns in 1860 and renamed the " Prince of Wales." A two-decker, the " Hindustan," was moored ahead of her, the two hulks being joined by a bridge. Life in the " Britannia," as Admiral Sir Reginald Bacon remarks in his reminiscences, " was largely one of open air and draughts, but we all thrived, and soon learned to climb like monkeys." The Royal Cadets entered into all the games and work of their shipmates, but had separate cabins. In no other way did their life differentiate from that of the other Cadets.

The " Britannia's " Captain was Henry Fairfax, who had been born in the reign of William IV and had entered the Navy in 1845. At the conclusion of the Princes' training Captain Fairfax received the C.B. (Civil). The Commander of the ship, Lord Ramsay, subsequently became M.P. for Liverpool, until he succeeded his father as 13th Earl of Dalhousie. He was the father of the present Rear-Admiral the

Hon. Sir Alexander Ramsay, husband of Princess Patricia. The First Lieutenant, E. S. Evans, had not long returned from the Ashantee War, where he commanded a company of the Naval Brigade. Another Lieutenant, J. M. Corfe, had been present in the flagship of Admiral Kuper at the bombardment of the forts of Kagoshima and the batteries at the Straits of Simonoseki, Japan, in 1864. In the 'seventies it was the art of handling a ship under sail which formed the background of instruction in the training ship, although navigation and mathematics had their part in the curriculum.

Among the Cadets of that time were Admiral Sir Reginald Bacon, who commanded the Dover Patrol in the War; Captain Sir Bryan Godfrey-Faussett, who has served His Majesty as Equerry for 35 years; Admiral Lord Stafford, late Commander-in-Chief at the Cape; and Admirals Sir Morgan Singer and Mark Kerr. The late Captain Sir Charles Cust, Admiral of the Fleet Lord Wester Wemyss (First Sea Lord during the latter part of the War), and Rear-Admiral Sir Robert Arbuthnot, who went down in H.M.S. "Defence" at the Battle of Jutland, were also shipmates of King George in the "Britannia." Most of the Flag Officers who commanded during the War knew the training ship, like His Majesty, during the 'seventies. Lord Jellicoe had entered in 1872, Sir Reginald Tupper and Sir Richard Peirse in 1873, Sir Cecil Thursby and Sir Montague Browning in 1874, and Sir Charles Madden and Sir John de Robeck in 1875. But Lord Beatty (1884) and Sir Roger Keyes (1885) belong to a later decade.

World Tour in the "Bacchante."

Prince George's first seagoing ship was the "Bacchante," an iron corvette cased with wood. She was of 4,130 tons, and had been launched at Portsmouth in 1876. Horizontal compound engines by Rennie of 5,250 horse-power gave her a speed of 15 knots. She was fully-rigged with three masts and yards, and the height of the mainmast from deck to truck was 149 ft., or within 30 ft. of the height of Nelson's monument in Trafalgar Square. Her guns were muzzle loaders on truck carriages. Her Captain was Lord Charles Scott, and Commander G. W. Hill was the executive officer, while the Lieutenants included the Hon. A. G. Curzon-Howe, who died in 1911 as Admiral and Commander-in-Chief at Portsmouth; J. Warde Osborne, now a retired Captain and C.B.E.; C. H. Adair, who died as an Admiral soon after the War; A. M. Farquhar, now a retired Admiral and K.C.B.; and W. B. Fisher, who died as an Admiral in 1926. Among the Midshipmen were Sir Hugh Evan-Thomas, who was a Rear-Admiral at Jutland; A. H. Limpus,

who was Admiral-Superintendent at Malta during the War; and A. H. Christian, who was also a Flag Officer afloat in the War. Of the officers of the civil branches, the late Canon J. N. Dalton held a temporary commission as Chaplain and served as tutor and governor to the young Princes.[1] Canon Dalton edited the log of the cruise, which was published in two volumes in 1886.

Prince George served in the "Bacchante" from August, 1879, to August, 1882, and during those three years the corvette cruised over 30,000 miles under sail, and 24,000 miles under steam. She visited the West Indies, South America, South Africa, Australia, Japan, China, Singapore, Colombo, and numerous ports in the Middle East. It was in her that the King first crossed the line and shared in all the usual experiences of a young naval officer of the time. The "Bacchante" was ordered to be sold in 1895, and on 31st July, 1897, was taken away from Portsmouth by her purchaser.

On 1st May, 1883, the Prince was appointed as Midshipman to the "Canada," Captain Francis Durrant, to serve on the North American Station. Captain Durrant had commanded the Royal yacht "Osborne," was promoted to Captain in 1876 on the conclusion of the Prince of Wales'[2] tour in India. The First Lieutenant of the "Canada" was M. P. O'Callaghan, who received the C.B. in the Benin expedition and afterwards became an Admiral. Her gunnery officer was the late Admiral F. S. Pelham. Among the other Lieutenants were Admiral the Hon. Sir Stanley Colville, now Vice-Admiral of the United Kingdom, and Admiral Bernard Currey, Senior Naval Officer at Gibraltar during the War. An officer of the old navigating branch, then gradually dying out, was C. C. P. Bawden. Amongst the other Midshipmen in the gunroom of the "Canada"—which was fitted out rather better than most gunrooms in those days, Queen Alexandra having supplied plated ware, table cloths, etc.—were Henry H. Campbell, who became an Admiral and Groom-in-Waiting to the King; the Hon. Francis H. E. J. Feilding, son of the 8th Earl of Denbigh; Adrian G. Allgood, who retired as a Captain; W. G. E. Ruck-Keene, who retired as a Rear-Admiral after the War; and Sir Sydney Fremantle, who became Commander-in-Chief at Portsmouth.

The "Canada" was a steel-built corvette of 2,380 tons, newly-completed at Portsmouth, mounting ten 6-in. 81-cwt. breech-loading guns. She had a speed of 13 knots and a radius of 5,400 miles at 10

[1] Prince Albert Victor also made the tour, for which the "Bacchante" had been specially commissioned.

[2] King Edward VII.

knots. During the time the Prince was in her, she followed the usual course of ships on the station, visiting most of the ports in the Northern Continent of America and in the West Indies. She was eventually sold to a shipbreaking company on 10th May, 1897. It was in the " Canada " that Prince George passed the usual examination in seamanship and was commissioned as Acting Sub-Lieutenant on 3rd June, 1884—the day on which he attained the age of 19.

During 1885, the Prince underwent the usual course for the rank of Lieutenant, at Greenwich and Portsmouth. While in H.M.S. " Excellent " for gunnery training, Lieutenant (afterwards Admiral Sir) Percy Scott was appointed as his governor, and Sir Percy records in his memoirs that His Majesty passed a most satisfactory examination and displayed extraordinary proficiency as a rifle shot. The Whale Island gunnery school was at this time in the making, and the students were housed in hulks in the harbour. A great revival in gunnery training and in the standard of marksmanship in the Navy had recently been started under the inspiration of Lord Fisher, who was Captain of the " Excellent," and the officers on his staff. Breech-loading guns had superseded muzzle-loaders, new methods of mounting had been invented, slow-burning powder and many other innovations were adopted as the result of scientific inquiry. An experimental staff had also been instituted, and the firing practice of ships improved immensely. The old method had been to heave a cask overboard with a flag on it, and as the ship fired, points were awarded according to how much over or short someone judged the misses to be. This was the method which the Royal Midshipman had seen carried out in the " Bacchante," and the wastefulness and uselessness of it is referred to in the log of that cruise. After 1885 large canvas targets were used, and only shots actually striking were allowed to count.

Service in the Mediterranean.

On 14th January, 1886, Prince George was appointed to H.M.S. " Thunderer," Captain H. F. Stephenson (later Admiral Sir Henry and Gentleman Usher of the Black Rod). He was only seven months in that ship when he was transferred to the " Dreadnought," where Captain Stephenson succeeded Captain F. G. D. Bedford in command. This " Dreadnought " was not, of course, the name ship of the all-big-gun turbine-driven battleships of the late War period, but an earlier turret-ship of 10,820 tons, completed at Pembroke in 1875. She mounted four 38-ton 12.5-in. muzzle-loading guns, worked by hydraulic power. Her engines, by Humphreys, were of 8,210 horse-power, giving her a speed of 14 knots, and with 1,330 tons of coal she could steam for

5,720 miles at 10 knots. As compared with earlier turret-ships, she had 14 inches of armour on the turrets instead of 12 inches, and the breastwork of the citadel was carried out right across the deck the width of the ship. The extent of the armour on the side of the vessel was also increased. This "Dreadnought" cost only £485,573 to build; she was sold at Portsmouth on 14th July, 1908, for £23,000.

It was in the "Thunderer," the "Dreadnought," and the "Alexandra" that Prince George became familiar with the Mediterranean Station when it was at the zenith of its grandeur and importance. His uncle, the Duke of Edinburgh, second son of Queen Victoria, became Commander-in-Chief on the station about this time, and flew his flag in the "Alexandra" at the time when the Prince served in her, from 21st April to 5th November, 1888. Among the officers in the various ships on the station were several who later attained high rank and distinction—Sir Compton Domvile, Sir Hedworth Meux, Sir George Warrender, Sir Frederick Hamilton, Sir Cecil Colville, Sir Colin Keppel, Sir Frederick Inglefield, and Sir James Startin. The Duchess of Edinburgh passed the winter at Malta during the tenure of her husband's command, and in various books of memoirs, notably "Looking Back," by Captain the Hon. Sir Seymour Fortescue, descriptions of service and life in the Fleet may be found. Sir Seymour, who served in the Admiral's yacht "Surprise," describes the many cruises taken in that vessel by the future King, among other people, and of Malta says that polo was the principal amusement. Racing was also taken very seriously, and "the best light-weight jockey in the island" was Mr. Midshipman David Beatty, whose father knew not only all about the horse, but how he should be ridden, and "his son had profited to the full by the lessons he had received as a small boy."

The "Alexandra," originally called the "Superb," but renamed when the future Queen Alexandra launched her, was the last central battery ship, and was completed in 1877. She carried two 25-ton and ten 18-ton guns, all muzzle loaders. She was fully rigged with masts and sails, and engined on the compound system. The loss of the "Captain" on 6th September, 1870, put an end to the idea of fully-rigged turret ships, but with the abandonment of masts and sails the advantages of the turret again became apparent, and from that time there was a contest between the central battery and the turret ship, in which the latter survived. Similarly, after a trial of Armstrong breech-loaders in 1864, this country returned to muzzle-loading ordnance, which was retained until about 1879. Like the "Dreadnought," the "Alexandra" was eventually sold out of the Navy on 6th October, 1908, to Mr. J. B. Garnham, of Upper Thames Street, for £21,750.

Following the return home and paying off of the "Alexandra," Prince George was appointed on 1st February, 1889, to the "Northumberland," Captain S. C. Darwin, flagship of Vice-Admiral John K. E. Baird, commanding the Channel Squadron. Her Commander was A. B. Milne, now Admiral Sir Berkeley, and Extra Equerry to the King. Here he became acquainted with an older type of armoured vessel, in fact the earliest, for the "Northumberland" was begun in 1861, two years after the "Warrior," and was completed in 1868. Built at Millwall and engined by Penn, she was originally a five-masted ship, but she was reduced to the more conventional three masts in 1875. She displaced 10,584 tons, and her armour belt weighed 1,660 tons, with a weight of 400 tons of teak backing, as compared with the 975 tons of armour and 350 tons of backing which covered the battery in the "Warrior." She had seven 9-in., 12-ton, and twenty 8-in., 9-ton guns, all muzzle loaders.[1] The "Northumberland" was renamed "Acheron" in 1904, became a coal hulk known as C.8 in 1910, and was sold to Messrs. T. W. Ward in April, 1927. In the "Northumberland" the King was again shipmates with Admiral Sir Reginald Bacon, who was her Torpedo Lieutenant, and who says in his "Naval Scrap-Book":—

> Not only was he (Prince George) thoroughly efficient in all the duties of a Lieutenant, but he was a shining example to all of us in that ship, and probably to everyone in the fleet, in the meticulous care he took as regards correspondence. Not only did he write home practically every day to his own immediate family circle, but no letter from a correspondent was left unanswered for more than twenty-four hours.

Independent Commands.

Prince George was twenty-four, and had been twelve years in the Navy when he received his first command. This was Torpedo Boat "No. 79," which he joined from the "Northumberland" for the review and manœuvres of 1889. The boat had already been in commission for two years; she was one of a number built by Yarrow and Co., Ltd., who were then at Poplar, and was 120 ft. long by 13 ft. beam, with a draught of 5½ ft. The displacement was 75 tons. Triple expansion engines of 1,000 horse-power gave her a speed of about 22 knots. The torpedoes carried were 14 inch, weighing some 650 lbs. each, with a range of 600 yards at 25-27 knots. The gun armament was limited to

[1] The "Northumberland's" armament was modified in 1875. Originally, it consisted of four 9-inch, twenty-two 8-inch, and two 7-inch, all R.M.L.

two 3-pounders. From 18th July, when the Prince commissioned her, to 6th September, " No. 79 " cruised in home waters, principally off the Irish coast, as a unit of " B " Fleet in the manœuvres. Before these began, King Edward VII, then Prince of Wales, reviewed the fleet at Spithead on behalf of the Queen, and among the guests on that occasion was the ex-Kaiser Wilhelm II, who was made an honorary Admiral of the British Fleet. " No. 79 " worked under Captain (later Admiral) C. C. P. Fitzgerald, who commanded the " Inflexible," which vessel, with the " Hecla " and six torpedo boats, was entrusted with the defence of Lough Swilly. Admiral Fitzgerald, in his book " From Sail to Steam," says :—

> August of 1889 was one of the stormiest I ever remember in the British Isles. It blew hard on most days, and when it was not blowing it generally rained, and on by-days, when it was not doing either, there was a fog ; so that the patrolling business was rather rough work for the little torpedo boats. But I had nothing else to do it with, for we had no good wholesome sea-going destroyers in those days. One of my torpedo boats was commanded by Lieutenant Prince George of Wales, who with one other officer and a Gunner had to run the show night and day.

The Admiral records a creditable piece of work on the part of " No. 79 " in taking in tow another torpedo boat which had broken down and was anchored on a lee shore in a rough sea just outside the breakers. After several attempts Prince George succeeded in rescuing his consort from a dangerous predicament.

On 6th May, 1890, the Prince, after requalifying in gunnery in H.M.S. " Excellent," hoisted his pennant at Chatham on board the new gunboat " Thrush " for service on the North American and West Indies Station. His executive officer was Lieutenant C. F. Thorp, who had served with him in " No. 79," and is now a retired Admiral. The navigator was Sub-Lieutenant L. F. W. Sanders. The " Thrush " went round to Plymouth on 24th May, 1890, and was ordered to convoy Torpedo Boat " No. 70 " to Gibraltar. She left with her on 1st June, put into Ferrol from 4th to 6th June, and arrived at Gibraltar on 9th June, after a rather stormy passage. After certain repairs, she left on 25th June, called at the Canary Islands from 29th June to 2nd July, and arrived at Bermuda on 18th July. During that summer and the early autumn the " Thrush " cruised to Halifax, Quebec, and Montreal, and during the winter of 1890–91 was in the West Indies, returning to Bermuda in March, and Halifax in the following June. On being recalled from the station, the " Thrush " left Halifax on 14th July, 1891, arrived at Plymouth on the 26th, went on to Chatham on 12th August, and

was paid off there on 24th August. It was on returning from this command that Prince George was promoted to Commander, from the date he paid off his ship. It is interesting to note that these two vessels which the King commanded were both still on the Navy List during the late War. The "Thrush" was converted into a salvage vessel, was wrecked in 1917, and formally paid off on 26th May, 1917. Torpedo boat "No. 79" was sold to Messrs. T. W. Ward for breaking up on 19th December, 1919, for £615.

Before Prince George went afloat again on service, the death of his elder brother had placed him in the direct line of succession to the Throne. He was created Duke of York on 24th May, 1892. From 29th June of that year until 2nd September he commanded the cruiser "Melampus," with the acting rank of Captain, for service during the naval manœuvres. His officers were Lieutenants C. E. Anson (navigating officer), Hugh Evan-Thomas, Sir Charles Cust, B. G. Godfrey-Faussett, and A. C. Leveson (Gunnery Lieutenant). The "Melampus" was attached to the Red Fleet, First Division, under Vice-Admiral Henry Fairfax, who had been Captain of the "Britannia" during the King's term there. On 2nd January, 1893, the Duke of York was promoted to Captain. His marriage took place six months later, and he did not serve afloat in command again until the summer of 1898. On 8th June of that year he hoisted his pennant in the cruiser "Crescent" for a special cruise, during which he visited a number of seaport towns. The "Crescent" also acted as guard-ship to Her Majesty Queen Victoria during Cowes Week of that year. Her Royal Captain left the ship on 26th August, and it was recorded at the time that "The leave-taking of the Duke was a hearty one, and was made particularly interesting by the presence of the Duchess of York." Most of his officers on this cruise had been shipmates with him before, among them Commander H. H. Campbell, Lieutenants Sir Charles Cust, Clement Greatorex, W. G. E. Ruck-Keene, L. F. W. Sanders, E. M. Phillpotts, and C. D. S. Raikes, with Sub-Lieutenant L. R. Oliphant (later Superintendent of the Royal Hospital School, Greenwich).

These two cruisers have both been sold out of the Service, the "Melampus" to the Shipbreaking Company on 12th July, 1910, for £9,000; and the "Crescent," to Messrs. George Cohen and Co., under an agreement dated 22nd September, 1921. In the late war the "Crescent" was the first flagship of the 10th Cruiser (Blockade) Squadron, under Rear-Admiral Dudley De Chair, operating between the Shetlands and Norway.

Although the circumstances of his exalted position did not permit King George to undertake any further service in the Navy, it

is well known that he has kept in close touch with all its activities. He was promoted to Rear-Admiral on 1st January, 1901, in view of the tour he was then about to undertake to the Colonies. Shortly after the death of Queen Victoria on 22nd January, 1901, he became Duke of Cornwall and York. With the Duchess he left Portsmouth in March, 1901, in the "Ophir," which had been specially commissioned as a man-of-war by Commodore A. L. Winsloe, with Commander Rosslyn Wemyss as executive officer. The "Ophir" visited Australia for the opening of the first Commonwealth Parliament, New Zealand, South Africa, and Canada, returning to Portsmouth in November. In that month the Duke was created Prince of Wales. In 1905–06 he made another overseas tour to India, in H.M.S. "Renown," Commodore the Hon. Hugh Tyrwhitt, escorted by H.M.S. "Terrible," Captain H. H. Campbell. In 1908 he visited Quebec to attend the Tercentenary Celebrations, taking passage in H.M.S. "Indomitable," Captain H. G. King-Hall, the first of the new battle-cruisers of the "Dreadnought" era. Two incidents made this voyage memorable. On the return journey the vessel travelled from Quebec to Cowes between 29th July and 3rd August, and from land to land—Belleisle to the Fastnet—she covered the 1,684 nautical miles in 67 hours—an average of 25.13 knots, while on one day of the run the speed averaged 26.4 knots. In this endurance test at high speed the Prince of Wales himself lent a hand by taking a turn at shovelling coal in No. 4 Stokehold.[1]

The numerous occasions on which, since his accession, His Majesty has honoured the Navy by his visits to the Fleet, including those he made during the War, will be fresh in memory and need not be recapitulated.

[1] The shovel used by His Majesty on this occasion was presented to the Institution by the Ward Room Officers, H.M.S. "Indomitable," and is now in the Museum.

GREAT NAVAL REVIEWS

By Commander H. P. Mead, R.N.

MANY naval reviews have preceded that which is to be held next July to commemorate the Jubilee of His Majesty's Accession, but it may be questioned whether they could all be described as "great." The importance of a Review may be measured by its naval, its political or its public value, but that the size of the fleet taking part in an assembly of this nature is no criterion is evident from the fact that, although the Reviews of 1773 and 1814 were described as great, the number of ships of the line present on those two occasions was only twenty and fifteen, respectively. Some naval reviews were organized primarily to interest the public and the Press; such was the concourse of warships which assembled in the Thames in 1909, when the rare spectacle was provided of destroyers moored close below London Bridge, and of other men-of-war in the river at various points between Westminster and Southend, where the main fleet lay. Other reviews, such as that held off Weymouth in May, 1912, were entirely naval in their aims. Then there were gatherings which were essentially political in their significance, one of which took place in 1827 prior to the Battle of Navarino, when the Duke of Clarence, as Commander-in-Chief at Spithead, inspected fifteen Russian, nine British, and nine French men-of-war.

The character of reviews has also varied according to their object. In those which were purely naval, the fleet was hard at work, exercising and manœuvring, the Sovereign sometimes being present, either in the Royal Yacht or the fleet flagship, leading the ships to sea and witnessing their evolutions and wartime practices. In others, particularly those designed for propaganda or political ends, there has been a decided element of junketing and entertainment, and if one may hazard an opinion, the Entente Cordiale celebrations of 1905 predominated in this respect, including as they did rounds of festivities, garden parties, fireworks, balls, and not least, the visits of parties of British officers to Paris, and of French officers to London.

In order that the final performance of a naval review should be accomplished with absolute smoothness and accuracy, a large measure of adjustment and rehearsal is always necessary. In a congratulatory signal at the close of the Coronation Review of 1911, His Majesty

the King expressed his appreciation of the "admirable appearance and marked precision of the lines." This precision was only achieved by the accurate mooring of the squadrons in their assigned berths, and it frequently happened that units had to shift berth, sometimes more than once, before they received the welcome ratifications of their positions, and the mooring swivels could be put on. Manning ship and the rendering of three cheers in "cold blood," when repeated several times a day, did not always commend themselves to the patience of the performers, though there was nothing left to be desired on their part on "the day." Plans for the proper instant of commencing a gun salute and especially for the switching on of night illuminations likewise had to be very carefully ordered. A careless preparatory testing of circuits by one ship often resulted in the blazing on of all lights in the fleet at an unintentional moment.

Once the researcher begins to explore the subject, it is astonishing to find what a great number of reviews have taken place, particularly within living memory. In the year 1909 alone, for instance, there were no less than three important inspections of the fleet; first, a gathering at Spithead in honour of the Imperial Press Conference on 12th June, then the visit of the fleet to the Thames from 17th to 24th July, already mentioned, and thirdly, a major royal review, again at Spithead, on 31st July. On Bank Holiday, 2nd August, the Czar, with two Imperial yachts, two Russian cruisers, and two destroyers, arrived and also reviewed the fleet before passing on to Cowes Week. Incidentally, it may be noticed that nearly every great naval review has been staged at Spithead, and that the day chosen has very often fallen on the same or nearly the same date. The reasons for these preferences are not far to seek. Portsmouth, as the premier naval port, with its great resources for marshalling and victualling an enormous fleet, together with its splendid natural roadstead for the assemblage of line upon line of huge vessels, has been the obvious centre to choose. Its proximity to Southampton, too, facilitates the visits of mighty liners carrying thousands of guests. Midsummer-day may generally be expected to be an auspicious time for venturing afloat, although the lateness of the hour before it is dusk somewhat delays the customary illuminations. It is remarkable how many reviews took place on 23rd and 26th June. It has been said that bad weather in July is to be expected at Spithead, yet several successful reviews were held in that month.

The earliest recorded naval review seems to have been that held at Portsmouth in the year 1415 when King Henry V inspected the caracks, barges, and balingers about to sail in the expedition which concluded with the victory of Agincourt. Mention of the subject does

not occur again until the reign of Henry VIII, who was accustomed to go in great state to Portsmouth to witness the departure of his ships.

In 1582 Queen Elizabeth watched a parade of the fleet from Upnor Castle, near Rochester, held in honour of the Duke of Anjou. This was said to be the first occasion when the ships were manned by the companies lining the bulwarks. James I, in 1611, and Charles II, in 1662, also visited Portsmouth to inspect their men-of-war, and from then onwards occasions for naval reviews became much more frequent. William III reviewed the fleet at Portsmouth in 1689, and again in 1692 after the battle of Barfleur.

We now come to the first naval review to be described by past chroniclers in detail. This was in 1773. On 22nd June King George III must have risen very early, for, proceeding by road from Kew to Portsmouth, he arrived at the landward defences between 10 and 11 a.m.; he then went on to take part in a formidable round of ceremonies, including a reception in the dockyard and a lengthy levée in the town, when the Mayor was knighted, before embarking at half past one in his barge to go to Spithead. During this visit, whenever he was rowed out to the fleet, the Captains of all the men-of-war had to accompany him in their barges, and also return to see him back again. He was received by the Board of Admiralty on board the "Barfleur," and an elaborate dinner was served there at 3.30 p.m., covers being laid for thirty persons. A tremendous number of salutes were fired during his embarkation and arrival at Spithead, and again as he passed each ship in his barge. At six o'clock he was rowed down the columns which comprised twenty ships of the line, two frigates, and three sloops. The King remained at Portsmouth for four days and, rising at an early hour each morning, commenced his inspections of the defences, the gun-wharf, and the dockyard at 5.30 or 6 a.m. Several further visits were paid to the fleet, including a review of the Blue Division under sail, with a good deal more expenditure of blank ammunition. The celebrations concluded with a generous bestowal of knighthoods and promotions, and the distribution of about £2,000 in largesse to the dockyard workmen, the King's barge's crew, and the local poor.

The great review of 1814 was carried out at Spithead by the Prince Regent, and was part of the entertainment arranged in honour of Alexander—Emperor of Russia, and Frederick—King of Prussia, who were over here on an extended and somewhat dazzled visit. It took place on 22nd and 23rd June, the second day being the more notable. The Duke of Clarence was in command, and other royalties were the Duke of York and the Duke of Saxe-Weimar. We were then at war with the United States and one item of the decorations in the harbour,

in rather bad taste, was an American flag upside down with the Union Jack above it. The most imposing feature of the celebrations was a procession of boats towards the fleet, headed by the Royal Barge bearing the Regent's standard and having on either quarter the barges of the Emperor and the King, rowed by our own King's watermen in livery and gold-lace caps, and flying the yellow flag with black spread-eagle, and the white flag with sable eagle of Prussia, respectively. A grand dinner on board the " Impregnable " followed, at which the honours were done by Admiral the Hon. Sir Henry Blackwood. The Emperor, with the democratic gesture popular on these occasions, drank grog with the ship's company of the " Impregnable." On the third day the fleet was reviewed under way. The accompanying shore festivities were enhanced by the great public welcome accorded to the Duke of Wellington.

The accession of Queen Victoria does not appear to have been the occasion for any naval review, and 1845 is the date of the next royal visit of any significance. There was only a small squadron present, but the day was an historic one because for the first time a screw steamer named the " Rattler " took part. In 1853, however, there was a marked contrast in the character of the ships reviewed by Her Majesty on 11th August. The spectacle, as usual, was said to be the most magnificent of its class. " British coal and iron had come to share in the duty of national defence," or, in other words, it had at last become recognized that steam and side-armour were important factors in modern sea warfare. The Channel Fleet consisted of thirteen screw vessels, nine paddle-wheelers, and three sailing ships. The Queen went afloat in the " Victoria and Albert," and the Admiralty in the " Black Eagle." The " Stromboli " was allotted to the Peers, and the " Bulldog " to the Commons. The Crown Prince of Württemberg hoisted his standard in the " Fairy," and the " Undine " carried Prince Don Juan of Spain. Amongst an enormous flotilla of private yachts and small fry, the United States clipper " America " was conspicuous. The main evolution took the form of the fleet steaming in two columns towards the Nab where the leaders stopped engines while the remainder moved up into line abreast to starboard and to port of them—a singularly unwarlike manœuvre, it would appear. This was followed by a sham fight, the line advancing at full speed and bombarding an enemy provided by the sailing division. After the return to Spithead, boats were manned and armed, and carried out a mock attack.

Few naval reviews have created so much stir as that of 1856. It was held at Spithead on St. George's Day, in honour of the peace and in recognition of the work of the Navy in the Russian war. Most

of the ships present had been employed in the Baltic or the Black Sea. There were assembled 240 craft, the greater number being gunboats (150) and mortar vessels (50). Although it was generally acclaimed as a magnificent success, there were a few dissentients, one writer in *Blackwood's Magazine* going so far as to characterise it as a " cold and dismal pageant." The complaint seems to have been that the lines were too strung out, and that the spectator was apt soon to become bored with looking at ship after ship, all alike.

Even after the railway line had been established as far as Portsmouth (Town) Station in 1847, Queen Victoria still preferred to go by train to Gosport and embark in the Royal Yacht there. I have been told that one reason for this was Her Majesty's objection to being stared at by the dockyard " mateys " ; on this occasion the royal train ran right into Clarence Yard. After the Queen had inspected the anchored lines of ships, the yacht steamed to the eastward and took up a position near the Nab, where the " Rodney " and " London " were moored as mark-vessels or " pivot-ships." Meanwhile, the fleet had weighed and, following Her Majesty in two columns, these wheeled outwards round the mark-vessels and returned to Spithead. The Lords of the Admiralty were in their yachts " Black Eagle " and " Princess Alice," while the " Transit " and " Perseverance " were provided for the Peers and Commons, respectively. Unfortunately, due to their special trains being very late in arriving at Southampton, there was a considerable hitch in embarking the Members of Parliament, and consequently they did not arrive on the scene till the review was half over. Needless to say, this contretemps did not pass unquestioned.

The units of the fleet which aroused the most interest were the new gunboats, and the four floating batteries, " Trusty," " Glatton," " Thunder," and " Meteor." These batteries were described at the time as low, flat, squat, black constructions, and although brilliantly dressed with flags, were far from beautiful. It was said that not even garlands of roses would give grace to these hippopotami. The gunboats moved easily, turned deftly and had a blunt determined look.[1]

Accompanied by the Sultan of Turkey and the Viceroy of Egypt, Queen Victoria again reviewed the fleet on 17th July, 1867, the weather being abominably wet and stormy. The lines contained no " non-steamers," which constituted a new record. Admiral Sir Thomas Pasley was in command, the Port Division of his squadron consisting of sixteen older wooden ships, while the Starboard comprised fifteen more modern iron vessels. All were ironclad, whether iron or wooden hulled. An innovation was the wearing of the white ensign by all

[1] *The Times*, 24th April, 1856.

the men-of-war. The Trinity House yacht " Irene " led the procession of seven Royal and Admiralty yachts through the lines, and it appears that this was the first recorded occasion of her doing so. Subsequently she was superseded by the " Galatea " and then in 1890 a new " Irene " came into service and was a familiar figure at all royal reviews, preceding the " Victoria and Albert " during the inspection of the fleet. In 1915 she was sunk by a mine and the present vessel is the " Patricia," which no doubt will as usual lead His Majesty the King past his ships in this year's Jubilee celebrations.

Yet another review held on 23rd June was that in honour of the Shah of Persia, in 1873. The distinguished company that assembled at Queen Victoria's private railway station at Nine Elms, preparatory to the journey to Portsmouth, included the Prince of Wales in Trinity House dress, the Tsarevitch in a green naval uniform, the Tsarevna, and the two young English princes, whose fair hair, pleasant looks, and sailor boy's dress won general admiration. The younger of these two was our present Sovereign, then aged eight.

The Jubilee review of 1887, held on 23rd July, witnessed further drastic changes in the fleet ; turret ships had come to displace broadside vessels, and four 80-ton gun battleships were for the first time included. The screw line-of-battle ships, paddle frigates, large sailing vessels, and screw mortar boats evident in 1856, had all disappeared. Admiral Sir George Willes was Commander-in-Chief at Portsmouth and other Flag Officers were Vice-Admirals Sir William Hewett, V.C., and John Baird, Rear-Admiral Hon. E. R. Fremantle and Commodores R. O'B. Fitzroy, and A. H. Markham. Captain A. K. Wilson, V.C., and Captain Compton Domvile were in command of the " Imperieuse " and " Collingwood " respectively, while among the Lieutenants in charge of the thirty-eight first-class torpedo-boats were Dudley de Chair, Charles Madden, Herbert Heath, Reginald Bacon, and William Pakenham.

A similar assembly on 5th August, 1889, comprised the same number of ships in the lines and included the " Benbow " with her 111-ton guns. If anything, this was the more imposing review, since the Kaiser was there in the " Hohenzollern " with eleven men-of-war of his own fleet. The Flag Officers present were Admiral Sir Edmund Commerell, V.C., Commander-in-Chief, in H.M.S. " Howe " ; Vice-Admiral John Baird in the " Northumberland," and Rear-Admirals Sir George Tryon in the " Hercules," R. E. Tracey in the " Rodney " and St. George D'Arcy-Irvine in the " Anson." Our present King was then a Lieutenant and in command of Torpedo-boat No. 79.

On 26th June, 1897, the Prince of Wales (Edward VII), deputizing for his august mother, reviewed the fleet assembled at Spithead in honour of her Diamond Jubilee. It was composed of 164 modern

vessels in the " highest state of efficiency," a contrast to the conditions of 1889, when the lines were said to contain certain obsolete craft. A high freeboard in battleships was the latest development, as could be seen in the four " Royal Sovereign " and the six brand-new " Majestic" class. The enormous " Powerful " and " Terrible," specially commissioned for the review, were considered the most formidable cruisers afloat, and were moored in an important position in the very centre of the lines. They were said to carry enough coal to take them round the world. In order to meet the increasing menace of torpedo-boats, many destroyers and torpedo-gunboats had been built, and were represented to the number of thirty and twenty, respectively. Well-known Flag Officers in the fleet on this occasion were Admiral Sir Nowell Salmon, V.C., Commander-in-Chief, with his flag in the " Renown," and Vice-Admirals Sir Henry Stephenson in the " Majestic " (Captain Prince Louis of Battenburg) and Compton Domvile, then Admiral-Superintendent of Naval Reserves. Men-of-war were sent from the following countries to take part in the celebrations ; Austria, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Russia, Spain, Sweden, and the United States. Besides the usual yachts in the royal procession, the liners " Eldorado," " Danube " and " Campania " carried round the Ambassadors, the Lords, and the Commons, respectively. On the conclusion of the review His Royal Highness desired the Commander-in-Chief to order the main brace to be spliced.

The Coronation review of King Edward himself unfortunately was upset by His Majesty's sudden and serious illness. The fleets, including sixteen warships from fourteen foreign Powers, assembled at Spithead on 28th June, 1902, but the inspection had to be put off, and when it did take place on 16th August, all the visiting men-of-war, with the exception of the Portuguese, Italian, and Japanese, had departed. There was a unique muster of well-known Admirals on this day : Admiral Sir Charles Hotham was in supreme command [1] and flew his flag in H.M.S. " Royal Sovereign," others present were Vice-Admirals A. K. Wilson, V.C., Sir Gerard Noel, and Sir Frederick Bedford ; and Rear-Admirals Hon. Assheton Curzon-Howe and Atkinson-Willes.

Our present King's Coronation naval celebrations and the review of the fleet on 24th June, 1911, have never been and are not likely to be surpassed in magnificence and brilliancy. There was then brought together the greatest number of British effective men-of-war ever recorded on a peace basis, described in *The Times* of the day as " an

[1] Admiral Hotham was then C.-in-C., Portsmouth, but went afloat to command the assembled fleet.

incomparable fleet, in instant readiness for war, without a 'dummy' in it." Since the preceding Coronation review there had been a complete transformation in the design of capital ships, and whereas in 1902 the "Dreadnought" had not been dreamt of, except perhaps in the brain of Lord Fisher, in 1911 there were twelve battleships and battle-cruisers of the all-big-gun, turbine-driven class, which had already gone far to make all past types obsolescent. The latest of these ships was the "Neptune." Meanwhile destroyers had developed by vast strides, and those present included the River and Tribal classes and H.M.S. "Swift," which far surpassed the craft of 1902 in armament and sea-keeping qualities. The presence of eight submarines, some being of the "D" class, showed that these vessels had come to be regarded as indispensable units of the fleet. The number of foreign Powers represented by up-to-date warships had now risen to no less than seventeen, including China and Turkey. Japan, as our great naval ally, sent two ships, the "Kurama" and "Tone." The German battle cruiser, "Von der Tann" was the subject of a good deal of speculation. Altogether there were about two hundred men-of-war present.

Needless to say, amongst such a huge concourse of vessels there was a large attendance of Flag Officers, including such well-known names as Sir Arthur Moore (Commander-in-Chief, Portsmouth), Sir Francis Bridgeman (Commander-in-Chief, Home Fleet), Sir George Callaghan, Sir John Jellicoe, Prince Louis of Battenberg, Sir Henry Jackson, Lewis Bayly, and Cecil Burney. Commodore Sir Robert Arbuthnot commanded the First Destroyer Flotilla, and Captain the Hon. Hubert Brand the Second Submarine Flotilla. The number of visitors and official guests was enormous, and in the royal train from Victoria were the Crown Prince and Princess of Germany and the heirs-apparent of practically every throne in the world, as well as all the members of our own Royal Family.

The greatest non-royal review of recent times was the inspection arranged by Mr. Winston Churchill, the then First Lord, for the Houses of Parliament on 9th July, 1912. Ninety-five Peers and 345 members of the Commons are reported to have been the guests of the Admiralty. The fleet consisted of 223 ships, and after the inspection at anchor it proceeded to sea at 5 p.m. and steamed past the visitors' ship, the "Armadale Castle." Although there was little advance in the aspect of the surface craft and submarines since last year, the presence of three naval aeroplanes, one of which actually flew off the deck of the "London," turned the thoughts of the spectators to the possibilities of this form of war-craft.

Following upon a test mobilization, the King carried out an "informal inspection" of the fleet on 18th July, 1914. His Majesty's

arrival had been delayed till late in the day owing to the grave political outlook in Ireland. The ships, in a line forty miles long, steamed out to sea past the Royal Yacht on the 20th, " the largest fleet ever seen in British waters," according to *The Times*. The earlier " Dreadnought " class had by now been succeeded by a " Super-Dreadnought " type of increased tonnage and heavier guns—" Orion," " King George V " and " Iron Duke " series. The latest destroyers were the well-known " L " class vessels which were very soon to distinguish themselves in the North Sea. Four airships, the " Astra Torres," " Parseval," " Gamma," and " Delta," besides twenty-three seaplanes and ten aeroplanes, sounded a new note in naval warfare. The officer in supreme command was Admiral Sir George Callaghan, who very shortly afterwards made way for Sir John Jellicoe when the vast armada was reconstituted as the Grand Fleet. The other Flag Officers present are too numerous to mention individually, but they all bore names which were soon to become honoured and renowned throughout the Service and the Empire. This test mobilization has been regarded as little short of a miracle, observing that in less than four weeks' time, the Navy, one and all, was engaged in the hostilities of the Great War.

The last great naval review was that held at Spithead on 26th July, 1924. The King, accompanied by the Prince of Wales and Duke of Connaught, embarked in the " Victoria and Albert," the Board of Admiralty used the " Enchantress," and Dominion and Foreign visitors and Members of Parliament were accommodated in the large minelayer " Princess Margaret." The number of ships assembled was only twelve less than that in 1914—193 as compared with 205; but the number of battleships had decreased from fifty-five to ten. Only one battle cruiser, the " Tiger," was present; but this was due to the absence of the " Hood," " Renown," and " Repulse " on a world cruise. A novel feature in this post-War fleet was the addition of two aircraft carriers, while aeroplanes of the Fleet Air Arm were lively participants in the day's activities—another contrast with the previous review when the seaplanes of the R.N.A.S. were allotted moorings. Further evidence of the reduction in numbers of heavy ships was to be seen in the crusier lines where nine light cruisers replaced the fifty-five of all types other than battle cruisers of the 1914 review. Lesser craft, however, were present in considerable numbers: 10 flotilla leaders, 88 destroyers, 24 submarines, 37 mine-sweepers, together with various auxiliaries.

The review marked the end of the active career afloat of a much respected Flag Officer, Admiral Sir John M. de Robeck, who was flying his flag as Commander-in-Chief of the Atlantic Fleet in H.M.S. " Queen Elizabeth."

SOME HISTORIC MILITARY REVIEWS

By Lieut.-Colonel B. G. Baker, D.S.O., F.R.Hist.S.

THERE have been military reviews ever since men took to organized warfare; and probably there always will be such reviews unless man discovers some way of living in agreement with his neighbour. But, while some reviews have been matters of great and portentous national, even international, concern, others have been of more provincial, even homely, aspect.

It is curious that, although a generous public applauds with equal warmth both kinds of review, accounts of these popular events are so meagre that a poet and a novelist have had to fill the gaps. Shakespeare shows you Falstaff reviewing his small army of " half a dozen sufficient men," and makes shrewd comment on the military organization of his day in the stout warrior's remark to Simon Shadow : " we have a number of shadows to fill up the muster book." The novelist who has handed down an account of a military review, himself a decided anti-militarist, tried to turn the whole affair to ridicule by sending Mr. Pickwick's hat trundling along at the head of the advancing host, while the owner of the hat added to the gaiety of the occasion by an exhibition of quite surprising agility. However, that review at Chatham, unrecorded in official publications, was probably just a local garrison affair, and unattended by any of the Great with the exception of Mr. Pickwick.

Such minor reviews were, and for that matter are still, of a nature to foster that spirit of inquisitiveness in General Officers which those of Other Ranks so earnestly deprecate. It was at one such review held at Ipswich, when the East Coast was preparing for a threatened visit from Napoleon I, that an inspecting General really did overstep the bounds of discretion. It was then the fashion to show between the lower edge of the stock and the top button of the waistcoat a little frill as outward and visible sign of an inward and material shirt. The General gave a little tug to one of these frills; it came away. He tried another with the same result; he had a pull at many more until the plain was strewn with " dickies " as those little frills were called. They were sadder and

wiser men, those of the militia regiment, owners of the frills, by the time the General had finished giving his opinion on the incident. However, a virtue of local provincial reviews is that they bring out many quaint and lovable old characters, veterans who hide their modest laurels in retirement. You may see them at any review even to-day, wearing medals of wars that seem far away and long ago: wars in Egypt, on the Indian Frontier, in South Africa; they arise early, work their way steadily into the front rank of the spectators, hold their peace in the chatter all around them, and follow with wistful eyes the colours of "the old regiment" as they are carried past to the sound of "Rule Britannia," "Come Lasses and Lads," or other heartening English songs. These are they who never fail to report themselves whenever King and Country call for fighting men; of these, the ever faithful, a most picturesque specimen appeared at a review held on Lexden Heath by H.R.H. the Prince Regent in 1811. The garrison of Colchester was drawn up; the spectators were pushing, sweating, cheering; the business of the day was about to begin, when up rode a very old but entirely hale and hearty warrior clad in a uniform of long ago. John Andrews was one of those who never missed a war if he could possibly help it, and in his time opportunities were plentiful. In his teens, he went to fight the Turks with Prince Eugene of Savoy; at Dettingen he acted as dragoon orderly to King George II, and refrained from winning the battle single-handed as any other orderly would have done, and has done, ever since orderlies assumed their great responsibilities. John Andrews also fought at Fontenoy and Culloden, and was wounded at the storming of Moro Castle, on Cuba. He had come on parade to offer his services again; he rode away with the assurance that a pension of fifty guineas a year would be added to his half-pay.

Colchester, as the most important centre of East Coast defence, has probably seen more reviews than any other garrison town of England, except possibly Aldershot. But then Colchester began the review habit when the Romans and Britons were still contending over the ownership of our island. In the days of the Roman occupation, however, reviews were doubtless more impressive than pleasing to the local populace.

Reference has been made to John Anderson's antiquated uniform; it belonged to a time when a man's coat, whether he were soldier or civilian, was his habitat, in which he lived and moved and had his being. But during his long years of service changes had crept in. For one thing the voluminous skirts were disappearing as a collar grew in height; and whatever went on to the collar had to come off the coat-tails. Then again the British soldier's coat was not uniformly red as heretofore;

not only Horse Guards and Gunners wore blue, but there was a gay crowd of light cavalry; dragoons with facings of many colours—scarlet, crimson, various shades of yellow, light-blue and pink. Then there were hussars to add their braided jackets and embroidered shabrachs to the vivid colour scheme. The infantry also showed a great variety of colour in its facings, ranging from white and buff through every shade of yellow, and from Royal blue into the light grey worn by the 56th Regiment. Green was ever a favourite colour; bottle, grass, and light-green; the 50th Foot still wore black, and brown was the colour of two other regiments. There is no record of rifle green and black as gracing the reviews held at and around Colchester in those early years of the XIXth century, but a number of Volunteer formations reverted to the green coat as worn long ago by the Suffolk militia, and, indeed, as worn by the Loyal Suffolk Yeomanry until recent days. Volunteers, Yeomanry, Fencibles of all descriptions, took part in military manœuvres, and probably introduced some unorthodox novelties; but it seems they all enjoyed being reviewed: this should be taken not as indicating the amateur, but as evidence of patriotic enthusiasm. These gallants, moreover, did not take their pleasures sadly; you may still see on the road that leads out of Ipswich to the former training area an inn sign showing the device "The Case is Altered." This alteration goes back to the time when peace had returned to Europe in 1815, and when, to the regret of the worthy inn-keeper, troops no longer moved about between the military stations on the East Coast.

By a martial, but definitely non-military, population reviews were always considered as popular entertainments arranged with a view to showing the taxpayer some return for his money. Mr. Pepys seems to have held this opinion. "When I come to St. James' I find the Duke of York gone with the King to see the Muster of the Guards in Hyde Park—so I took a Hackney-coach and saw it all." There was "mighty fine firing" that day, "but the well ordering of the men, I understand not," declared Mr. Pepys, and left it at that. Mr. Pepys had had his show and was content, and that appears to have been the attitude of the public towards military reviews from earliest days. The authorities were disposed to meet the public view and arrange impressive spectacles, such as the joyous occasion in Windsor Park during the reign of Charles II. An elaborate presentation of the siege of Maestricht was staged in the meadows below the Long Terrace. Mines were sprung, big guns were fired, indeed no effort was spared for the delectation of some thousand keenly interested spectators, who surely went home with the comfortable feeling that "the Army's all right." Assurance of this kind was needful from time to time, for warning voices could be heard saying

that foreigners were forming wrong ideas about the British Army. Because they were only shown Household Cavalry and Foot Guards, the intelligent foreigner went away with the impression that our regiments of the line were not fit to be seen. " This must be remedied," said the Press in 1851, and in response Woolwich rose to the occasion, producing a very exhilarating review in which cavalry charged about in clouds of smoke obligingly produced by the Royal Artillery, while infantry of the line and the Woolwich and Deptford District of Chelsea Pensioners kept up a lively accompaniment of musketry. At about the same time the Chairman of the House of Commons Committee on Army and Navy Ordnance Estimates was being told that the R.H.A. was practically immobilized for lack of horses, while France and the Neapolitan Government were busy buying them in Suffolk.

It was King James II who first made a regular habit of holding military reviews. He favoured Hounslow Heath for this purpose, and the custom was continued until our own time. Among the most splendid of the many reviews held on this site that of 1825 stands out above the rest ; four regiments of cavalry—1st Dragoon Guards, the Greys, 7th Hussars, and 12th Lancers—as well as a brigade of Royal Horse Artillery, assisted at " battle manœuvres " which were " executed on an imposing scale, and the precision of the troops received unqualified approval." The Royal Dukes of York, Sussex, and Cambridge graced this function with their presence. King James was a good soldier, and might have made a better ruler had he kept to soldiering alone or, at least, not mixed it with politics. His choice of Hounslow as a review ground for his newly formed standing army was largely influenced by the consideration that it would overawe the lively citizens of London. It did nothing of the kind ; on the contrary, London's influence on the troops seems to have been considerable. This circumstance may account for the unexpected and unwelcome answer the King met with when he asked his soldiers for an opinion on current politics. The voice of the Army was heard, but, it must be noted, under extraordinary circumstances. As a general rule well-behaved armies do not loudly express their opinions, especially concerning politics. On different matters, such as reviews, " Other Ranks " become almost lyrical. Indeed a review of some sixty years ago was a formidable affair, and gave an apt illustration of what some soldiers consider to be the aim of all staff-work, namely, the greatest inconvenience of the greatest number.

There are probably but few gunners now with us who took part in what seems to have been a charming little local review. One survivor, a bombardier at the time, still has lively recollections of the day. It must have been late in 1871, for the tale is of Napoleon III reviewing

troops from Woolwich. " We marched to Chislehurst and then up and down before the Emperor and back to Woolwich. We wore half Wellingtons, and one of my feet was a multicoloured blister at the end of the day. All our reviews were in heavy marching order, i.e., knapsack with great coat and canteen, these with the big pouch-belt and haversack across one's chest, and the big belt for the sword bayonet trussed one up pretty completely, and the head could not be thrown back because the busby came into contact with the canteen whenever you did that." The knapsack was obviously the worst part of the equipment, and a little later was still worn by this bombardier at a review in honour of the Queen's birthday on Southsea Common at which a line battalion turned out with the new valise equipment—a matter of envy, for the wearer just slipped, unaided and in a moment, out of all his outfit, whereas another strong gunner's help was required to relieve Atlas of his burden. A new field gun was introduced about this time, and in 1872 the 40-pdr. Armstrong breech-loader gave a good account of itself at Shoeburyness. The Marquis of Lorne and Princess Louise, newly wed, had come down to watch the new gun fire at a running target. The first round knocked the target over ; there was not another ready, so the entertainment was cut short.

The two longest reigns in the more recent history of our country were alike in this, that, as far as the soldier in his decorative capacity was concerned, it was always one review after another with spells of training for these functions in between. Looking back on those two periods, 1760 to 1901, in their immense importance to Great Britain and the world at large, it is interesting to note how military reviews seem to punctuate changes as they occur, but with a certain reluctance, as if loath to part from a cherished past. Where the soldier was most nearly affected, in his uniform, change was generally unwelcome, even when it was made with a view to giving him greater ease in his movements. Drill had become a tradition and a hard taskmaster ; everything that increased rigidity of movement was encouraged. When George III came to the throne the soldier's " uniform livery " differed only in its more pronounced colours from the dress worn by the civil population. By 1820 the soldier was so tightly buttoned up and strapped down that he was almost incapable of movement, at least so our French neighbours had been heard to declare. It was an unkind criticism in view of the fact that we, and most other nations, had taken the French as dress-models and followed them faithfully with here and there a little national vagary of our own, such as the sash—an article of dress that our neighbours discarded long ago. King James II introduced the sash into the uniform of British soldiery ; he took it direct from King Louis XIV's Guards—cut, colour and all. It was not until the last Stuart King had

left that white was replaced by crimson and gold for wear round an officer's waist.

Attempts at simplifying uniform dispensed with the gold, leaving only the familiar crimson sash worn either round the middle or over the shoulder, according to the æsthetic taste prevailing in high places. By the time of Queen Victoria's coronation an innovation had been introduced from Prussia; the high collar of the coatee was no longer open at the top, but hooked right up to its sharp edges. That coronation, as is only right, was celebrated by her Majesty's Army with a number of stately reviews. They offered a curious link with what seems now a remote past, but in 1838 was probably only a matter of "yester year." Among the many distinguished strangers visiting London on the occasion of a review of Artillery, Sappers and Miners, under Sir Hussey Vivian, were the Duke de Nemours and Marshal Soult; a great feast of roast beef and plum-pudding was provided after the review for the troops, their wives, and children—about 4,500 of these latter. Soult attended the review in Hyde Park shortly after, where three troops of R.H.A., 1st and 2nd Life Guards, Royal Horse Guards, 10th Hussars and 12th Lancers, three batteries of R.F.A., 1st and 3rd Grenadier Foot Guards, 1st and 2nd Scots Fusilier Guards, and 1st and 2nd Battalions of the Rifle Brigade, paraded before the young Queen, who "was looking remarkably well." Soult on arriving at the Park broke his stirrup; his attendant was at once dispatched to Laurie of Oxford Street, and returned with the identical stirrups that Napoleon had used in all his campaigns. There were present also H.R.H. the Duke of Cambridge, the Duke of Wellington, the Duke de Nemours again, Prince Esterhazy, Prince Schwartzenberg, Count Strogonoff, and many other foreigners of distinction; "the Park was crowded to excess by persons in carriages, on horseback and on foot."

The review at Woolwich in 1851 has already been noted. This was in the year of the Great Exhibition, from which it was expected that it would ensure peace by bringing together representatives of many nations. It certainly brought a very varied assortment of dignitaries from the Grand Duchy of Hesse, the Hansa Towns, Northern Germany, Rome, Sardinia, Tuscany, the Zollverein, Tunis, and Turkey. A few years later most of the many nations were taking sides in some war or other. The year of the Great Exhibition also saw the *coup d'état* in France; the Crimean War broke out a few years later, to be followed by the Indian Mutiny; then France and Austria desecrated the beauty of Northern Italy by fighting all over it; North America indulged in civil war; Garibaldi launched his Neapolitan enterprise; Prussia persuaded Austria to attack little Denmark; and two years later drove the Austrian

armies out of Bohemia and forced the friends of Habsburg in Germany into the Prussian system. Then came France versus Germany; Russia versus Turkey; and, to wind up the century, Great Britain's costly war in South Africa.

According to tradition, therefore, here were plenty of occasions for reviews. The return of the troops from the Crimea was an obvious occasion; it had, moreover, a lasting effect on the British Army in that it proved to every one of Her Majesty's soldiers that he served a very gracious lady, and one who was deeply concerned in his welfare, which, hitherto, had been seriously neglected. In July, 1856, Queen Victoria reviewed her troops on Bagshot Heath, and thanked them in glowing terms for the devoted services they had rendered her and the nation. The Queen, dressed in a scarlet habit, richly laced, and wearing the riband of the Garter, watched the march past of her troops in pouring rain that July day; Dragoon Guards and Hussars, Horse and Field Artillery, Rifles, Regiments of Foot, and Highlanders; and among these an echo of the Hanoverian connection now broken by the accession of a woman to the throne of England—a body of German Legionaries, Cavalry, Foot, and "Jäger." Her Majesty was attended by the Prince Consort, the King of the Belgians, Prince Oscar of Sweden, the Comte de Flandres, and the young Prince of Wales "on a capital blood pony which he sat with much ease and grace." It was in the same month that Lord Hardinge was taken suddenly ill; he retired and was succeeded in command of the Army by H.R.H. the Duke of Cambridge.

From 1856 onward reviews are invested with deeper significance. In the first place the somewhat insular outlook made way to an air of spaciousness, due to a growing appreciation of the nation's expansion overseas. In the second place, the connection with Germany by way of Hanover, established nearly a hundred and twenty-five years before the accession of Queen Victoria had been dissolved, the country's attitude to the ideal of a German Empire intended to dominate Continental Europe, was changing as Colonial expansion added new responsibilities to Crown and Parliament of Great Britain. All the time, however, personal relations with Germany were improving, while French influence was waning. But the latter still showed in the British soldier's uniform, and the shako and tunic copied from France after the Crimean War had not altered much by 1871. In that year there was a considerable reviewing of troops; Guards and 10th Hussars, commanded by Colonel Baker, paraded under H.S.H. Prince Edward of Saxe-Weimar before the German Crown Prince, who shortly afterwards attended a great review at Aldershot. Troops formed up in review order without knapsacks in the Long Valley, three batteries of Field Artillery, companies

of Royal Engineers and eleven battalions of Foot ; an imposing array, yet there was something wrong with it ; out of a possible strength of 19,506 men only 12,549 appeared on parade. In the same month, July of 1871, Marshal McMahon reviewed French troops in the Bois de Boulogne ; but very few spectators witnessed the event.

The British Army of 1871 was in need of reform. By 1887, when Queen Victoria reviewed troops on the occasion of her Golden Jubilee, many reforms had been effected. As tribute to German prowess, the shako had been replaced by a quaint imitation of the Prussian pickelhaube. The old regimental facings had been replaced by white ones : according to the wise men, mostly retired, this was regarded as being a sure sign that the Army was going to the dogs. The 1871 review emphasized two factors of growing importance, the demands of India on the standing Army, and the worth and quality of the Volunteer Force. Of the Aldershot garrison that year the linked battalions of fine old county regiments were distributed widely about the Empire—six in India, the 1st Battalion Green Howards in Egypt, the 1st Royal Inniskilling Fusiliers in South Africa, and the 2nd Northamptons in Hong Kong. Of Volunteers, seventy-four corps found 40,000 men for the great review ; they came from every part of the Kingdom—South Wales Borderers, Bedford Rifles, London Irish, men of Kent and Kentish men, Artillery, Engineers, and Cadets from Public Schools.

More brilliant still was the martial display on the occasion of the Diamond Jubilee. The British Army, at its very gayest in outward appearance, was reinforced in all its bravery by contingents of Colonial forces, representatives of which had come from afar to do homage to the Queen-Empress. The extent of Her Majesty's Dominions was revealed to the unobservant people of this island in the list of corps and regiments represented : Canadian Cavalry and Mounted Police, Cape Mounted Rifles, New South Wales Lancers, and Mounted Rifles from all Australia and New Zealand, Natal Carabiniers, Rhodesian Horse, Cavalry from Trinidad and Ceylon. Jamaica, Sierra Leone, Bermuda, St. Lucia and Mauritius sent Gunners and Submarine Miners. The infantry were headed by the West India Regiments, parading with Sikh Malay State Guides, Chinese Police, Housas from the Gold Coast, and many others. To all these was assigned the post of honour under command of Lord Roberts, mounted on his grey arab. The old Constitutional Force was represented by battalions of the King's Royal Rifles, Scottish Rifles, and men from Lancashire. The Commander-in-Chief rode at the head of the Royal Horse Guards, the Prince of Wales led his 10th Hussars, and the Duke of Connaught the Scots Guards. Little more

than two years later many of those who had taken part in all this glory were going out to war in South Africa.

Scarlet and gold made a stand against khaki in the years after the South African War, but reviews were no longer the brilliant affairs of former days. Gone were the bright-coloured shabrachs of all but the Household Cavalry, the crimson and gold full-dress sashes and belts had returned to limbo, and some regiments of Yeomanry had abandoned the hussar busby for a slouch hat of a pattern also adopted by the Westminster Town Council for its street sweepers; it seems that to wear a hat of that kind was vaguely considered as an expression of Empire-mindedness. Nevertheless the review of the 1st Army Corps held by King Edward VII at Aldershot in 1903 was a brilliant affair; it was significant, too, for several reasons: first because M. Loubet, President of the French Republic, attended at the King's invitation, secondly on account of the criticisms passed by the Press. The critics remarked that "the artillery is, as ever, perfect at all points," but that the numerical weakness of many infantry battalions was painfully obvious. The Army, again, was in need of a reformer. He arose out of unlikely surroundings, and rather too late as usual. The Great War was approaching with giant strides, to throw its grizzly shadow over all the former "pomp and circumstance of glorious war," and relegate the splendour of military reviews to the bright pages of illustrated history books.

GOLD MEDAL ESSAY (NAVAL), 1934

By LIEUTENANT G. M. BENNETT, R.N.

SUBJECT

"To consider in all its aspects the minimum size of the capital ship demanded by modern conditions of warfare."

BY the Washington Naval Treaty five nations agreed that 35,000 tons should be the maximum displacement of future capital ships. The building race which had preceded this decision led to the "Rodney" and "Nelson" displacing this tonnage.[1] During the subsequent decade the necessity for such great ships has formed a much debated subject; Admiral Richmond has given his considered opinion that capital ships should approximate to 6,500 tons, while Captain Acworth favours 12,000. In spite of the almost magical properties attributed by some writers to the new 10,000-ton "pocket battleships" of the "Deutschland" type, France has laid down two ships of 26,500 tons—the "Dunkerque" and "Strasbourg"; and Italy is building two vessels of 35,000 tons, the "Vittorio Veneto" and the "Littorio."[2]

By the London Naval Treaty the three principal Sea Powers, after failing to agree to a reduction in the maximum permissible size, postponed future capital ship construction until 1937. In 1935 the London Naval Treaty is due for revision, and it seems probable that the Washington Agreement will receive consideration at the same time. Further delay in capital ship building by the British Empire, America, and Japan is hardly possible, and each of these great nations, whose conception of strategy is based upon the use of sea power, will build new battleships. To each the essential problem is "what size shall they be?" Each should find the answer in the logical principle that ships should be kept as small as possible having regard to the work to be done. The factors which govern the size of a capital ship are numerous, and the opinions

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[1] Actual displacements are given as "Nelson" 33,500 tons, and "Rodney" 33,900 tons. These figures are taken from *Jane's Fighting Ships*, which, with *Brassey's Naval Annual*, have been used for the majority of the data given in this paper.

[2] Since this was written, France has laid down a 35,000 ton battleship, and a second ship of the same displacement is projected.—EDITOR.

of both individuals and nations upon their practical application are legion. Yet a logical consideration of those factors, which fall into four inseparable groups—military, political, economic, and technical, must form the basis of any attempt to determine the minimum size demanded by modern conditions of warfare for this class of warship.

Construction has been well defined as applied strategy; the design of a warship must depend upon the duty which it has to perform in carrying out that strategy. The principles of naval strategy, established and proved by the great sea commanders of the past, remain true to-day: a nation must ensure the protection of its trade on the sea; must protect its own shores against invasion; and must deny to an enemy the use of the sea for its own trade. Two complementary fighting forces exist to carry out this policy under conditions of modern warfare—a navy and an air force.

THE MERCHANT SHIP AS A BASIS.

Trade and troops must be carried over the sea by merchant ships. Some of these may be armed for their own defence; others, for the period of war, can be diverted from their natural function and converted into armed merchant-cruisers for attacking an enemy's trade and escorting convoys. Such ships are an important asset to a naval force, but the experience of the Great War has shown that a nation cannot afford to divert many merchant ships from their normal duties; they are at best a makeshift, for, owing to the extremely vulnerable nature of their hulls and the large target which they present to gunfire, they are ill fitted to engage even a similar adversary. The "Carmania" may have sunk the "Cap Trafalgar," but the victor was little better than a wreck at the end of the action. From the need for a vessel which, while able to attack an armed merchant ship, is also able to withstand any blows that she may receive, is born the fighting ship.

Before deciding the full requirements of this fighting ship it will be necessary to consider briefly the technical possibilities of the merchant-cruiser. The vulnerable nature of her hull has already been noted. By the Washington Treaty the five Powers agreed not to make any structural arrangements in merchant ships which would enable them to mount guns of a calibre greater than 6-inch; but, apart from such agreement, it is impracticable to strengthen a ship to enable it to mount a gun of greater calibre without unduly interfering with her primary *raison d'être*.[1] On the other hand, there are some very large liners

[1] There was a single exception in the Great War. The German raider "Wolf" mounted one 7.6-inch gun.

afloat or on the stocks in which it might be practicable to mount ten or more 6-inch guns on a broadside; but the ammunition storage and supply arrangements would be dangerously unprotected, and would hardly be sufficient to provide a high rate of fire, even if her inevitably reservist crew could be trained to the standard which this requires. But ships of such size are few: there are only 29 with tonnages in excess of 25,000 in the world, divided among the nations thus:—

Britain	12 (including the "Queen Mary")
United States	1
Japan	0
Italy	5
France	6 (including the "Normandie")
Germany	4
Holland	1

Extensive arming of the large type of merchant ship is therefore unlikely to affect the strategical situation; and, even if Britain possesses an undue proportion of such craft, she has shown by the late war that she is unlikely to adopt such a procedure for the reason that these great ships are too extravagant with fuel.

The remaining ships of the world's mercantile marine are below this tonnage, and their average size is restricted by the size of the ports which they must use and the average cargo which they may expect to carry without undue demurrage. The 4,000 to 10,000-ton tramp is the rule, and it may therefore be said that the average armed merchant-cruiser is unlikely to mount more than four 6-inch guns on a broadside.

The following table gives an idea of the speeds of the merchant ships of the world in 1933:—

26 knots and over	2
24–26 knots	12
20–24 knots	117
15–20 knots	817

The greater proportion of the remainder have speeds below 12 knots.

THE CRUISER.

It is now possible to obtain some idea of the requirements of the basic warship, commonly called a cruiser. She must have a speed in excess of the majority of merchant ships afloat—that is about 24 knots; she must mount an armament capable of dealing a hard blow upon the light structure of her hybrid adversary—4.7-inch is suggested as sufficient; she must possess the ability to avoid the effects of punishment by light armour over her vitals and ease of manœuvre;

and she must have the endurance necessary for ocean warfare, which implies ability to steam great distances and to maintain a reasonable speed in a seaway. If fleets consisted only of vessels whose size was determined on this absolute basis, they would have to engage similar enemy vessels in battle. It would be but natural to detail them to work in pairs, so that if they encountered a single enemy vessel they would overwhelm her. An enemy will naturally retaliate, and the units working together will rapidly increase from two to three or more. But if these basic warships be thus formed into squadrons or fleets to attack enemy warships, it is clear that they are being diverted from their functional duty. The next step thus reveals itself; to build a ship whose primary function is to fight any opposing warship. This is the genesis of the capital ship.

Indirectly, therefore, the first factor governing the size of the capital ship is the armed merchant-cruiser; directly it is the cruiser. The principle of concentration of force will serve as sufficient justification for the fact that capital ships do not work singly: the natural tendency to combine them into pairs to oppose a single ship leads to the concentration of all a nation's capital ships into one unit—the battle fleet. Such a force requires "eyes" if it is to attain a tactical advantage. Under conditions of modern warfare this duty is partly fulfilled by aircraft, but surface vessels to co-operate with them are still essential. Reconnaissance duties necessitate good wireless, sufficient power to maintain contact with similar enemy vessels, and speed to move from one part of the tactical ground to another without being crushed by the enemy heavy ships. These requirements are similar to those of a cruiser, and they differ only on the point of gun power. The invention of the torpedo has led to the modern destroyer armed with 4.7-inch or 5-inch guns. To strike an effective blow at these craft requires 6-inch guns. It would be unsound in more ways than one to build vessels solely for fleet duties, and it is only natural to combine their requirements with those of the cruiser, which will then have the following characteristics:—

Armament . .	Four or more 6-inch guns.
Speed . . .	At least 26 knots.
Endurance . .	10,000 miles at 12 knots.
Protection . .	3-inch side plating over her vitals.
Good wireless and sea-keeping qualities.	

But while such data may form the basis of cruiser design, many other factors have entered into the problem, so that the cruisers of the fleets of the word can be scaled from ships of 3,000 tons, which having been built for limited needs do not fulfil the above requirements in every detail, to craft of 10,000 tons armed with eight 8-inch guns, and exceed-

ing the above figures by an unnecessary margin. The United States' opinion is that 8-inch guns are necessary for attacking an armed merchant-cruiser, but there is no evidence to support such a view, and in reality such large cruisers are usurping in a limited manner the duties of the capital ship. There is a school of thought which believes that such vessels would be capital ships if all the existing battleships and battle-cruisers were scrapped. But just as the armed merchant-cruiser is not a cruiser, a cruiser cannot be a capital ship. Almost complete lack of protection leaves them vulnerable to hits by 6-inch guns, while their own 8-inch cannot direct an overwhelming weight of fire upon a smaller cruiser. It has also been said that the 8-inch cruiser is similar to the armoured cruiser of the past and that, as at Tsushima, it can form part of the battle fleet. But surely the destruction of the " Warrior " and " Defence " at Jutland is sufficient deterrent to such a practice. If the capital ship is to carry out its function, it must be strong enough to resist attack by any other warship and powerful enough to deal a decisive blow at its opponent. From these requirements it would be possible to determine the absolute size of the capital ship, but just as the absolute cruiser is a *rara avis*, so is the battleship. The size of the latter must be governed by the size of those of its opponents, and we come therefore to the problem of relative size.

THE CAPITAL SHIP.

In 1863, at the battle of Lissa, battleships of 7,400 tons produced a decisive victory. Half a century later similar results were achieved at Tsushima with 15,000-ton ships. In 1916 ships of 20,000 tons failed to produce conclusive results. If it was possible to obtain a decisive victory with capital ships so small as 7,400 tons, why were larger ones built half a century later, and why have even larger ones been built since ? The answer may in part be due to material developments, but it lies mainly in the inevitable human desire to build ships better, which means more powerful, and consequently of greater tonnage, than an opponent. The result is ever-increasing size.

In the XVIIIth century, French warships were distinctly superior to the English, yet the latter achieved victory by superior strategy and tactics, and a higher standard of leadership and morale. At Lissa, the Yalu, and Tsushima—the three principal battles fought between iron-clads prior to the Great War—the materially weaker fleet secured a victory in each case. Even at Jutland, where the morale and skill of the two fleets were about equal, it cannot be said that the materially superior fleet obtained a decisive victory. Surely the lesson of these examples is that, while superiority in weapons is desirable, it is by no

means essential: victory depends more on morale and leadership, which can, within limits, transform material inferiority into fighting superiority. It may further be argued that the great size of the capital ship in the late war, and subsequently, is a factor conducive to an indecisive result, consequent upon a commander's natural hesitation to risk the vast and consequently valuable, and probably few, units available. This is a definitely undesirable influence on tactics, for war cannot be waged without risk.

Limitations of Size.

During the late war, and more especially in the few years subsequent to it, the competition in capital ship building reached such a pitch that the original functional size became totally obscured: the importance of factors other than material were forgotten, with the result that capital ships of such great size were contemplated that another by no means unimportant factor, the economic, was called into play. The general aspect of this factor is clear: the larger the ship the more it costs to build and subsequently to maintain, not only directly in fuel and repair, but indirectly in the inevitable requirements of increased docking facilities. Public opinion exercises a considerable influence over the amount spent on armaments, and shortly after the great new ships had been decided on by the principal Sea Powers it became increasingly clear that neither the financial situation nor public opinion would allow Great Britain to maintain naval superiority with such expensive ships. America, though wealthier, had other reasons for wishing to call a halt in the naval race, and the newest factor in determining the size of the capital ship came into existence in treaty limitation. It is the author's opinion that the existence of naval limitation treaties must be taken into account as a feature of modern warfare, at least so far as capital ships are concerned, because it is impracticable for any nation to violate the treaty in peace by building ships in secret, and subsequent to war being declared it would take a minimum of two years to produce a ship which was in excess of treaty limits. The Washington and London agreements were born of common sense out of need for economy, and it is to be expected that, in some form, they will remain in force for many years to come. In spite, however, of the introduction of the limitation factor in capital ship design, the economic aspect must not be neglected, and since these two are so closely connected it is now proposed to consider their combined influence on the size of the future ship.

The present capital ships of the three principal maritime Powers

are limited in numbers and individual tonnage, and the largest [1] approximate to vessels of 35,000 tons armed with 16-inch guns. New ships must inevitably be laid down before long to replace the older vessels; but it is hardly possible that all the existing battleships could be scrapped at once, and replacement can only take place over a period of years if the limitations of the economic factor are borne in mind; strategically, too, it would hardly be possible to accept a transitional period when no battle fleet existed. This prohibits, so long as numbers of individual ships are limited, any great reduction in size, for the approximate equality in material strength required by a battle fleet would not be maintained if one nation were to design her new ships on functional requirements and the other to continue the present size. If all nations were to design their new ships on functional requirements, the battle fleets in a few years time would consist of some large and very powerful ships and some which were so comparatively weak as to be unfit to lie in the battle-line. Tactically at least such a battle fleet could not be accepted. It might be argued that the risk could be taken if a number of years peace was considered probable; but the objects of naval strength are more than those of war, and for a nation whose strength is based on sea power to place herself in a position in which she was unfit to exercise that power for a decade would rob her of her greatest insurance against war.

It is, however, possible that a new agreement will take the form of total tonnage limitation rather than of actual numbers. Would it be an advantage to build numerous smaller ships or few large ones? By reduction to the absurd we may argue that, if fearlessly handled, sixteen 2,000-ton destroyers would sink one 35,000-ton battleship. But if one nation was to adopt such measures, it would suffice for the other to alter the design of its battleships so that they carried a greatly increased secondary armament, sub-divided under a number of controls, to render such attack abortive: tactically it would be exceedingly difficult to handle the one hundred and sixty destroyers necessary on such a basis to attack a battle-fleet of ten 35,000-ton ships. At the other extreme, if it was possible to build one enormous ship of 350,000 tons, she might be a match for ten of one-tenth that tonnage, but such a battle fleet would strategically and tactically be so inflexible as to be almost useless. There are strategic advantages in numbers, more especially to a nation with world-wide interests, but there are tactical disadvantages if the number of ships in the battle-line is too great. More smaller ships may make it easier to gain superiority at the decisive

[1] H.M.S. "Hood," of 42,100 tons, is a special exception which does not affect this argument.

point, but strategy and tactics are of greater importance in achieving that superiority than actual numbers or size.

A reduction in size produces a corresponding reduction in the building cost, although the maintenance charges by no means decrease directly with the tonnage, as the following figures show :—

"Nelson" . . 33,500 tons ; annual upkeep £432,960
"Cumberland" . 10,000 tons ; annual upkeep £238,850

Any great reduction in cost would encourage the smaller Powers to build battleships instead of the cruiser squadrons with which they are now content. The possible combination of two or more of these fleets would disturb the existing balance of sea-power, and Britain, the United States, and Japan would have to build many more capital ships. With the inevitable increase in the number of cruisers and destroyers which such battle-fleets would require, the final result would be more expensive navies than those which treaty limitation has successfully achieved. It must not be forgotten that it is only possible for the principal Powers to accept fleets limited by treaty because, with rare exceptions, their capital ships are so much stronger than those of other nations.

The object of this paper is to discover whether a smaller capital ship would be acceptable, not only to Britain, but to any or all of the principal Sea Powers. Their strategic positions indicate that, in any future war between them, at least one Power will have to operate its battle fleet at a great distance from home waters. Although it may be said that Great Britain, with its multitude of bases abroad, is best served in this respect, such advantage is nullified if her battle fleet consists of ships of such great size that they cannot use, and more particularly be docked at, those bases. The United States is at a similar disadvantage in Pacific waters, and both nations are in urgent need of better docking facilities for their present fleets. Large sums have already been expended in attempts to remedy this situation. How much better, economically and strategically, to spend this money on warships which are of such a size that they can use the docks, both naval and commercial, already in existence. One of Britain's battleships has twice grounded within the past year in harbours designed for the use of her fleets. Such an accident in war might seriously hamper the execution of an operation.

Endurance.

If fleets are to operate at great distances from their bases, they must be so constructed that they can carry sufficient fuel to proceed to the tactical ground, engage the enemy, and return to their base. Different nations have different needs, and those with the longest distances to

steam must be provided for. From England to the West Indies is 4,000 miles; from San Francisco to Yokohama is a little more. Cape Town to Fremantle is 4,700; Panama to New Zealand is 6,500. Unless a strategical plan is to be unduly hampered, the future capital ship should be able to steam across such distances and back without refuelling, and have sufficient reserve to enable it to operate for a time in distant waters. The representative distances quoted above indicate that it is desirable that the endurance of the future capital ship should approximate to 10,000 miles.

Closely allied to the endurance factor is ability to operate successfully on the oceans of the world, which means that a ship must be designed so that she can keep at sea in all weathers, and can maintain a reasonable speed and be a steady and dry gun platform in a rough sea. However obvious these items may seem, the lessons of Coronel serve as a sharp reminder that too often have our ships been designed by the North Sea mind.

It has been the object of the author's argument to show that the military, economic, and political factors all indicate that some reduction in the size of a capital ship would be advantageous; but the over-riding importance of fighting superiority cannot be surrendered, and, in order to safeguard this, something approaching material equality with the present large vessels must be maintained in the capital ship of the future. Whether a reduction in size can be effected while preserving the necessary strength is a matter for technical consideration; and in this respect it should be borne in mind that no more equipment should be placed in the ship than is essential—a point too often forgotten.

Main Armament.

In a capital ship the weapon which gives decisive results is the gun, and the main armament is therefore the most important technical consideration. The maximum size of gun which may be mounted is 16-inch, and this treaty limitation is unlikely to be removed; but because this is the maximum permitted, is it necessary to mount such a gun even if an opponent is so armed? At Tsushima the comparative strength in guns was:—

	12" & 12.6"	*10"*	*8" & 9"*	*6"*
Russian Fleet . .	26	15	8	66
Japanese Fleet . .	23	1	34	98

Even if the deficiencies of the British armour-piercing shell at Jutland be taken into account, it can hardly be said that the hitting power of the German 11-inch and 12-inch guns compared unfavourably with the British 13.5-inch and 15-inch. These and other historical precedents

support the theory that the biggest gun is not necessary for victory If then an opponent mounts 16-inch weapons, what is the minimum size which can be accepted ?

Brassey gives the following table of details concerning naval weapons, which are substantially the same for all nations :—

Calibre.	*Weight of Gun.*	*Weight of Projectile.*	*M.V.*	*Penetration.*	*Rounds per Minute.*	*Weight of Mounting.*
8″	15 tons	256 lbs.	3000 f.s.	35″	6	147 tons
9.2″	29 tons	380 lbs.	3000 f.s.	39″	4	257 tons
10″	26 tons	500 lbs.	2900 f.s.	42″	3	287 tons
12″	43 tons	850 lbs.	2900 f.s.	50″	2	431 tons
13.5″	66 tons	1400 lbs.	2500 f.s.	51″	(1.5)[1]	558 tons
14″	80 tons	1560 lbs.	2500 f.s.	52″	(1.5)[1]	588 tons
15″	87 tons	1951 lbs.	2500 f.s.	55″	—[1]	844 tons
16″	105 tons	2000 lbs.	2600 f.s.	59″	1.2	1270 tons

Perhaps the most important point revealed by this table is the relatively great increase in weight of projectile between the 12-inch and 13.5-inch weapons. It will be seen, too, that, if the size be increased to 16-inch, although a still heavier projectile can be fired, the power of penetration is not greatly increased, the rate of fire becomes slower, and the weight of the mounting is more than doubled.

The gunnery problem involved in hitting a moving target at sea necessitates the firing of a number of guns in a salvo, partly for observation purposes, but more especially owing to the inevitable spread of the fall of shot, and it is generally considered that three guns fired simultaneously is the minimum. Rate of fire is also of importance and, because with the heavier weapons this is inevitably slow, it is desirable to mount twice the number of guns required in one salvo, so that they may be fired alternately. Battle endurance necessitates, firstly, that a reserve be available to allow for breakdowns and damage, so that four guns per salvo is advisable ; secondly, that a secondary means of loading, which is easier to arrange with weapons smaller than 16-inch, be provided.

If, then, eight heavy guns be required, should they be mounted in double or triple turrets ? The former has long been the practice in the British Navy, but the latter has found favour in others. The Americans in particular favour the triple mounting and, mechanically

[1] Brassey gives no rate of fire for 15-inch guns, but it is known that this is two rounds per minute. The corresponding figures for 13.5-inch and 14-inch are at least equal to this.

at least, we cannot accuse them of lacking in astuteness. It is therefore suggested that the triple mounting be adopted; this will give the advantage of one additional gun, while the total weight of such an armament should not exceed that of eight guns in four double turrets. It is admitted that there are certain mechanical difficulties in the construction of triple turrets, but it should not be beyond the wit of armament designers to overcome these problems.

Let us then take the plunge and accept the 13.5-inch gun for the future capital ship, nine of these weapons being mounted in three triple turrets. We may place these turrets together in the fore-part of the ship, or we may separate them. The heavy alterations of course necessary to avoid torpedo attack from massed aircraft, and the undesirability of losing the target by a temporary cessation of fire, favour an all-round arc of fire at least for part of the armament. Even if a greater weight is then necessary for armour protection of the hull, it is considered that the main armament should be mounted with two turrets forward and one aft.

Great range may complicate the gun mountings by the need for higher elevations and may involve elaborate fire control gear, but it must be considered necessary. However small the rate of hitting may be at 36,000 yards, a fleet which is hit at all at such a range, whilst it cannot reply until that range is closed, starts at a definite disadvantage. Nevertheless, whatever the maximum range of the guns of either fleet, the effective range remains at about 15,000 yards. The Nelsonic maxim: "Engage the enemy more closely," will always remain the secret of decisive results, and ability to dictate that range is a question of speed.

Speed.

The means of compelling an action are strategical rather than mechanical. The "Inflexible" and "Invincible" crossed the Atlantic at an average speed of 12.5 knots, and yet reached the Falkland Islands twelve hours before Von Spee. Intelligent anticipation is of greater importance than mechanical speed in the execution of a strategic plan. The speed of a battle fleet should primarily be such as to ensure that it has a reasonable chance of supporting its cruisers. At Tsushima the average speed of the battle fleet was 14 knots, but that of the cruisers was not in excess of 18. The speed now required by a cruiser has already been assessed as at least 26 knots: in practice the cruisers of to-day have speeds in excess of 30. Tactically, therefore, a battle fleet speed of 14 knots would not be sufficient to-day.

The United States make no secret of their intention to adopt long-

range fighting in future battles, and consequently an important tactical problem is presented to the existing British battle fleet. Modernization has given American ships a maximum gun range of 38,000 yards. With three exceptions, British battleships are limited to about 24,000, and it is only by exploiting the tactical advantage of a battle speed exceeding the American ships by about one knot, that Britain could hope to reduce to the minimum the time in which she cannot reply to enemy gun-fire ; but for that speed superiority the American fleet could dictate the range for as long as it wished. The battle speed of existing capital ships is between 20 and 22 knots, and it is therefore suggested that it is desirable for the speed of new vessels to be at least of this order, and preferably more. Long-range fighting and battle-fleet speeds of 22 knots are features of modern warfare, and they cannot suddenly be swept away. If superiority of battle speed be decided on, let it be attained by a distinct margin, and 25 knots is therefore suggested. The sooner battle fleets get within effective gun range, the less will any disparity between heavy guns be of consequence.

One objection to such a speed is that the smaller the ship the greater the power in proportion to size required to obtain a given speed. But since some indication has been given that it is unlikely that the future capital ship will be as small as 10,000 tons, the following figures will show that this argument is not of great importance :—

" Hood " . . .	41,200 tons—31 knots ;	3.5 h.p. per ton
" Cornwall " . .	13,600 tons [1]—31 knots ;	5.3 h.p. per ton
" W " Class Destroyer	1,480 tons—31 knots ;	18.2 h.p. per ton

A greater objection, however, lies in the fact that to attain any speed the power required varies as (speed)^n, where n is normally 2 but goes up rapidly at high speeds. The power required for 25 knots will therefore directly affect the prospective size of a capital ship. In order to give the " Hood " a speed of 31 knots, not only had armour to be sacrificed, but she had to be of immense tonnage and size.

Germany has had to design the " Deutschland " with every possible weight-saving expedient, and has adopted Diesel engines of 56,800 horse-power to give her a speed of 26 knots. It has been stated that these engines have the low weight of 17½ lbs. per horse-power, and this has resulted in very strong support for Diesel engines in future capital ships. This figure is, however, most misleading, since it does not take into account the gearing, shafting, or air reservoirs. A later authority [1] has given the weight as 47.9 lbs. per horse-power, and simple calculation on this basis gives the total weight of the engines as 1,200 tons—a far

[1] These are sea-going displacements.

more probable figure than the earlier one of 445. Since the engines of H.M.S. " Kent " only weigh 45 lbs. per horse-power there would almost appear to be a balance in favour of steam, but perhaps the best argument against the Diesel is the recent conversion of the liner " Asturias." Originally she was Diesel driven, but it was desired to raise her speed by several knots. To enable her to do this *within the space of the existing engines* it was found best to fit her with modern super-heated steam turbines, a conversion which has achieved excellent results this year. It has been argued that a greater cruising radius is possible on a given quantity of fuel with a Diesel-driven ship, but this is largely counteracted by the newest developments in superheated steam installations. There is no need to consider this argument further ; its purpose has only been to show that no great reduction in tonnage can be achieved by using Diesel-drive, and that it is immaterial therefore with which type the future ship is fitted.

The Italian cruiser " Trento " of 36 knots has an engine weight-ratio of 33 ; the British " Kent " of 31 knots has a similar factor of 45. Such disparity is not due to any greater ingenuity on the part of Italian engineers, but because they are prepared to accept a lower figure of reliability. The " Kent's " engines will, in fact, run for a longer time at high speeds without giving trouble—an essential feature of endurance. On the other hand the " Hood," built in 1918, had an engine weight-ratio as high as 83, yet no doubt is expressed as to the sufficiency of that of the " Kent." This disparity is due to post-war developments in engine design, and the introduction of super-heated steam which has greatly raised the efficiency of modern machinery. In a given space, and with a given weight, engines of much greater horse-power than was possible a decade or more ago can now be installed. Nevertheless to attain 25 knots in our prospective ship, without sacrificing other important items to engine power, is not going to be done without difficulty ; therefore the question of hull design must receive consideration. The first torpedo had a pointed nose, but a great increase in speed was effected when the present semi-spherical blunt nose was developed. It is a simple principle of streamlining, as the design of modern aircraft, high-speed locomotives, and cars will show, that a blunt bow and pointed stern is productive of the highest speeds. Ship design appears to have lagged behind in this recent development, for with the exception of a bulbous tendency below water in a few modern liners, ships are still designed with sharp bows. The author is no expert either on streamlining or on ship design, and no doubt the ability to steam into a head

[1] Captain A. M. Proctor, U.S.N., in the *United States Naval Institute Proceedings* for June, 1930.

sea has a great influence on the latter, but it does seem probable that there is room for improvement in the shape of a ship's hull below water, and that increased speed could thereby be produced.

Secondary Armament.

A capital ship requires protection against attack by aircraft, submarines and destroyers. Whilst this may be provided by similar craft attached to her, circumstances may arise when these vessels are otherwise engaged. To a certain extent a capital ship might then rely on armour and other purely passive means of defence, but there can be little doubt that she requires guns for offence against such craft as well. For use against destroyers it is common practice to fit twelve 6-inch guns, six being on each broadside owing to the structural difficulties of mounting them on the centre-line at the same time as the main armament. No capital ship has been constructed since the power of aircraft at sea was realized; consequently the high-angle armaments in existing ships are of a makeshift, and often insufficient, nature. The provision of small weapons of the multiple pom-pom type will not substantially affect the design or weight of our proposed ship, but the need for a long-range high-angle armament is another matter. Experience, admittedly of peace only, has shown that it is desirable for a capital ship to mount sufficient of these weapons to be able to engage at least four aircraft simultaneously. This necessitates a minimum of eight guns sub-divided under four controls. As with the anti-destroyer armament, these guns cannot be mounted on the centre-line. For reasons of blast from the heavy guns, and defence against splinters and Lewis-gun attack, the crews should be under at least light protection.

Considerations of space will show that there would be great difficulty in mounting such an armament in addition to batteries of 6-inch guns, and since it has already been observed that a battleship is provided with other forms of defence against attack by light craft, it is for consideration whether the weapons necessary for both anti-destroyer work and long-range high-angle fire could be combined in one armament. The difficulty will be the calibre of the gun. It was decided that cruisers must mount 6-inch guns because against destroyers anything smaller has insufficient stopping power. But cruisers cannot rely on the stopping power of counter-destroyer attack from which a battleship benefits; hence in the latter the calibre of the anti-destroyer weapon might be reduced. High-angle gunnery requires a very high rate of fire, and it is improbable that this can be achieved with a gun larger than 4.7-inch. It is suggested, therefore, that this size might also be accepted for anti-destroyer work. Under these conditions the future capital ship could

mount sixteen 4.7-inch guns in eight double mountings, each with splinter-proof protection for the crew. These guns will be divisible into four groups, each under a separate control, and will be available for high-angle or low-angle use; and it will be seen that, while ability to engage four aircraft simultaneously is provided for, it is still possible to engage destroyers and aircraft at the same time.

Protection.

The extent to which it is necessary to provide armour protection on the hull of a capital ship is an important question, since it has a very considerable bearing on tonnage. The "Deutschland," being restricted to 10,000 tons, could only be given 5-inch plate. This degree of protection, coupled with her 11-inch guns, makes her powerful enough to overwhelm any cruiser afloat without suffering vital damage herself; but 5-inch armour is insufficient to withstand blows from 11-inch or larger weapons, and she depends upon her speed of 26 knots to avoid the capital ships of opposing Powers. In fact she is too weak to perform the duties of a capital ship under conditions of modern warfare, because no battle can be won by flight, and no naval strategy can ultimately be successful unless the enemy battle fleet is defeated or immobilized.

It has been argued that to obtain decisive results a battle fleet should close to effective gun range. Capital ships must then be so protected against gunfire that they can close to and remain at this range, withstanding hits from enemy shells for sufficient time to enable their own fire to obtain effective results upon an enemy similarly armoured. It is indeed under such conditions that superior morale can turn material weakness into fighting superiority. Conditions of modern warfare may mean an enemy equipped with 16-inch guns: what degree of armour protection is needed to withstand such fire? Details of the latest warships of the principal Sea Powers are as follows:—

United States—"Colorado"	16″–14″	waterline belt.
	18″– 9″	barbettes.
	5″– 3″	deck.
Japan—"Mutsu"	12½″	waterline belt.
	14½″	barbettes.
	7″–3″	deck.
Britain—"Nelson"	14″	waterline belt.
	16″–9″	barbettes
	6½″	deck.

It is at once clear that opinion varies within narrow limits as to the exact thickness required, but, since the "Nelson" is the latest of the three, and represents a mean figure so far as the above vessels are concerned,

she will be accepted as a guide to the design of the future ship. The "Nelson" was armoured to withstand 16-inch gunfire at both long and short ranges, and it is considered that nothing weaker should be accepted. The provision of a 6-inch deck should be ample protection against aircraft bombs.

The late war gives many examples of ships being struck by mines; of these an analysis shows very conflicting results. In a number of instances small cruisers were mined, but managed to return to port for repair, yet the "Audacious," struck by one mine, sank in a few hours. In a similar way the efficiency of torpedo fire is difficult to assess, in particular if the example of the "Marlborough" at Jutland be remembered. But, in general, if the internal sub-division of the hull is small, and if pumps of sufficient capacity are provided, a ship struck by a single mine or torpedo has every chance of returning to harbour in safety. The torpedo armament of modern destroyers is now, however, much greater than it was in the Great War, while the advent of aircraft has brought additional danger from this weapon; so that the possibility of a capital ship being struck, not by one torpedo or mine, but by half a dozen during the course of an action, must be considered. Another very important point which must be taken into account is the extent to which apprehension, almost dread, of under-water damage influenced tactics in the last war. It is, in fact, necessary not only that a capital ship should be able to withstand hits from four torpedoes, but that the results of these hits should have the minimum effect upon her fighting strength. The only effective way to do this is by underwater protection which, in accordance with the latest practice, takes the form of a system of buoyancy spaces inside the hull, similar to the bulges added externally to older ships.

By the use of high-grade steel and electric welding in the place of rivets in the hull it is estimated that 550 tons has been saved in the weight of the "Deutschland." This has resulted in a great increase in cost, and when such a saving in weight is not essential it is hardly warranted. But there is no doubt that by the use of electric welding inside the hull, and of the lighter metals for non-watertight bulkheads, ventilation trunking, and a hundred and one other ship fittings, a considerable reduction in tonnage can be effected without any loss of efficiency.

The value of torpedo tubes to a capital ship is problematical. There is no recorded instance of successful results in battle, but it is acknowledged that they may be of considerable value to a retiring fleet in delaying the advance of its pursuers. But if the tubes are below water several large compartments in a vulnerable part of the ship must be accepted. If above-water tubes are fitted, the warheads are dangerously

exposed to enemy gunfire, and may well react to the distinct disadvantage of the vessel carrying them. There is no need to be dogmatic about this matter, but the author would feel quite happy if torpedo tubes were omitted from our capital ships.

The 1934 British combined fleet exercises in the Atlantic provided a graphic illustration of the results of a gale upon the fighting efficiency of warships. The older capital ships of the " Queen Elizabeth " and " Royal Sovereign " classes suffered from flooded turrets and secondary armament batteries, and it is very doubtful whether parts of their armament could have been fought during the major part of the gale. The " Nelson " and " Rodney " with their high free-boards were immeasurably drier and their fighting efficiency was hardly affected.

It has been argued that one advantage of the smaller ship is the reduced target presented to bombs, and gun and torpedo fire. The effective target for a torpedo is dependent on the length of the ship, but a glance at the relative lengths of the " London," of 10,000 tons–633 feet, and the " Nelson " of 35,000 tons–702 feet, will show that any reduction which can be effected in this respect is inappreciable. The beam and freeboard of a ship are important factors which affect the danger space presented to shellfire, and as a defensive measure it would be desirable to keep these to a minimum ; but the offensive advantages of a high free-board already referred to are considered sufficient to outweigh this. Indeed the necessity for providing space for aircraft, wireless equipment, gun control positions and, by no means least, that standard of accommodation for officers and men which modern conditions of living ashore inevitably demand afloat, favour the larger hull. It may be added that, while a smaller ship does present a smaller target to any kind of attack, she also suffers relatively greater damage from a hit.

There is no space here to reiterate the many arguments for and against the use of oil in warships. The nations of the world are inevitably committed to its use, and reversion to coal in a navy will not remove the strategic importance of assuring the safety of oil supplies in war. As far as reduction of tonnage is concerned oil has every advantage, for its storage is easier to arrange, a considerable reduction in engine-room complement and consequently of accommodation space can be made, whilst a greater steaming radius on a given quantity of fuel is possible.

THE PROPOSED DESIGN.

The general features of the future capital ship can now be summarized. She will carry an armament of nine 13.5-inch guns in triple turrets—two forward and one aft, and sixteen 4.7-inch guns on protected

twin mountings, arranged for high and low-angle fire and divisible under four separate controls. The maximum main armament range will be 38,000 yards. There will be no torpedo tubes, but she may carry one or more aircraft with catapults. She will be protected with a main belt of 14-inch armour, with a 6-inch deck, and 16-inch to 9-inch barbettes. She will be fitted with oil-burning boilers providing superheated steam, and with turbines giving her a speed of 25 knots, and an endurance at 12 knots of 10,000 miles. Her hull, below water, will be streamlined to the maximum possible extent, and will have an internal underwater protection system; but her beam will not be greater than 90 feet, since this, more than length, is the factor which prohibits the use of existing docks by capital ships. Above water she will be flush-decked to ensure a high freeboard: and she will be constructed internally with all the newest weight-saving devices.

Without the knowledge of a ship constructor it is impossible to assess accurately the dimensions, horse-power, or tonnage of such a vessel, but it is possible to compare it with the new French capital ship:—

"Dunkerque."	*Proposed Ship.*
8—13.2" guns in quadruple turrets.	9—13.5" guns in triple turrets.
16—5.2" guns.	16—4.7" guns.
10½" main belt.	14" main belt.
7" deck.	6" deck.
29.5 knots.	25 knots.
7,500 miles at 15 knots.	10,000 miles at 12 knots.

Since both vessels are to be flush-decked, the only essential differences are in the armour and speed. Since the proposed vessel should not require more than two-thirds the power of the "Dunkerque," the increase in weight due to more armour protection will be counteracted by reduction in engine-power. The dimensions of the future capital ship may therefore be assessed approximately as follows:—

	"Dunkerque."	*Proposed Ship.*
Length . . .	689 feet	.. 650 feet
Beam . . .	98.4 feet	.. 90 feet
H.P. . . .	100,000	.. 65,000
Displacement . .	26,500 tons	.. 27,000 tons

The whole design is a compromise between the many factors involved, and the figures quoted cannot be more than approximate without producing the full plans for the ship. Were those plans attempted, it would be perfectly reasonable to alter the calibre of the guns, or the armour protection, or the speed within small limits, with considerable effect on the resultant size and tonnage. If designers could break away

from traditional ideas there are many ways in which tonnage would be reduced. To cite but one: could not the heavy mainmast and boat derrick be abandoned in favour of a light crane? In view of the latest developments in the design of wireless transmitters, a high main aerial is no longer an essential factor in maintaining efficient communication, while that colossal waste of man-power, the main derrick, is no longer necessary now that the heavy picket-boat is obsolescent.

In conclusion, attention must be drawn to the Appendix [1] to this paper, wherein the details of the author's capital ship are set out beside those of representative existing vessels. Attack by these, together with their complementary air and surface craft, are the modern conditions of warfare which a capital ship must face. It is hoped that the major points have been dealt with sufficiently to show that a vessel of 27,000 tons is the minimum which can be constructed with the full powers of a capital ship, that is to say, a vessel that is fit to take its place in a battle fleet in the place of any existing ship. Further, that, if numbers remain limited, in ten years time a nation which has adopted such a size can, without undue risk, oppose her battle fleet against an equal number of 35,000-ton vessels with 16-inch guns. Unless these conditions are satisfied the author's vessel is too small. The greatest advantage of the smaller ship is that, if future limitation takes the form of total tonnage, it will be possible to build twenty of 27,000 tons to oppose fifteen of 35,000. The present maximum tonnage and gun calibre are unlikely to be reduced now that Italy has laid down the "Vittorio Venito" and "Littorio" of this type, but as soon as one of the great Powers takes the initiative in reduction of size it may be hoped that others will follow; and if a general reduction does take place it will then be possible still further to scale down the size of capital ships until they eventually approach their functional size.

For the present the author contends that his proposed ship is little inferior to the 35,000-ton type, and, as there are so many historical precepts for the fact that material superiority counts little if morale and leadership be lacking, any nation will attain fighting superiority with a fleet of 27,000-ton capital ships if its navy remembers that "the strength of the ship is the Service."

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[1] See p. 274.

APPENDIX.

	Proposed Type	*"Nelson" (Britain)*	*"Colorado" (United States)*	*"Mutsu" (Japan)*	*"Deutschland" (Germany)*	*"Dunkerque" (France)*	*"Littorio" (Italy)*
Tonnage . . .	27,000	33,500	32,500	32,700	10,000	26,500	35,000
Length . . .	650 ft.	702 ft.	600 ft.	700 ft.	609 ft.	689 ft.	?
Beam . . .	90 ft.	106 ft.	97 ft.	95 ft.	67½ ft.	98 ft.	?
Engines . . .	Super-heated steam turbines	Turbines	Electric drive	Turbines	Diesel	Turbines	?
H.P. . . .	65,000	45,000	39,000	46,000	56,800	100,000	?
Speed . . .	25 knots	23 knots	21 knots	23 knots	26 knots	29.5 knots	?
Endurance (miles—at 12 knots)	10,000	15,000	About 5,000	About 5,000	10,000 (at 20 knots)	7,500 (at 15 knots)	?
Main Armament .	9—13.5″	9—16″	8—16″	8—16″	6—11″	8—13.2″	16″ ?
Rate of Fire . .	2 r.p.m.	1.2 r.p.m.	1.2 r.p.m.	1.2 r.p.m.	3 r.p.m. (?)	2 r.p.m. (?)	—
Secondary Armaments	16—4.7″ (combined H.A. & L.A.)	12—6″ L.A. 6—4.7″ H.A.	12—5″ L.A. 8—5″ H.A.	20—5.5″ L.A. 4—3″ H.A.	8—6″ L.A. 4—3.4″ H.A.	16—5.2″ H.A. & L.A. (?)	—
Torpedo Tubes . .	*Nil*	2 submerged 24″	2 submerged 21″	4 A.W. 4 submerged 21″	8 A.W. 19.7″	? ?	— —
Armour . . .	14″ belt 16″–9″ turrets 6″ deck	14″ belt 16″–9″ turrets 6½″ deck	16″–14″ belt 18″–9″ turrets 3″ deck	12″ or 13″ belt 14″ turrets 7½″–3″ deck	5″ belt 7″ turrets 3″ deck	10½″ belt ? turrets 7″ deck	— — —

RECIPIENTS OF THE ROYAL UNITED SERVICE INSTITUTION GOLD MEDAL

(With rank of Officers at the date of the Essay).

1874 Captain H. W. L. Hime, R.A.
1875 Commander G. H. U. Noel, R.N.
1876 Lieutenant J. F. G. Ross of Bladensburg, Coldstream Guards.
1877 Captain P. H. Colomb, R.N.
1878 Major T. Fraser, R.E.
Captain E. Clayton, R.A.
1879 Captain The Hon. E. R. Fremantle, C.B., C.M.G., A.D.C., R.N.
1880 Captain J. K. Trotter, R.A.
1881 Captain L. Brine, R.N.
1882 No Medal awarded.
1883 Captain C. Johnstone, R.N.
1884 Captain G. T. Browne, Northamptonshire Regiment.
1885 Lieutenant F. C. D. Sturdee, R.N.
1886 Captain C. E. Callwell, R.A.
1887 No Medal awarded.
1888 Captain J. F. Daniell, R.M.L.I.
1889 Captain H. F. Cleveland, R.N.
1890 Captain G. E. Benson, R.A.
1891 Captain R. W. Craigie, R.N.
1892 Lieut.-Colonel J. Farquharson, C.B., R.E.
1893 Commander F. C. D. Sturdee, R.N.
1894 Major F. B. Elmslie, R.A.
1895 Commander J. Honner, R.N.
1896 Captain G. F. Ellison, Queen's Royal West Surrey Regiment.
1897 Commander G. A. Ballard, R.N.
1898 Captain W. B. Brown, R.E.
1899 Commander G. A. Ballard, R.N.
1900 No Medal awarded.
1901 Lieutenant L. H. Hordern, R.N.
1902 Major A. H. Terry, A.S.C.
1903 Lieutenant A. C. Dewar, R.N.
1904 Lieut.-Colonel C. E. D. Telfer-Smollett, 3rd Bn. South Staffordshire Regiment.
1905 Major W. C. Bridge, South Staffordshire Regiment, *p.s.c.*
1906 Lieutenant B. E. Domvile, R.N.
1907 Lieut.-Colonel A. F. Mockler-Ferryman, Reserve of Officers.
1908 Major A. B. N. Churchill, R.G.A.
1909 No Medal awarded.
1910 Captain P. W. Game, R.H.A.
1911 Captain H. T. Russell, late R.G.A.
1912 Commander K. G. B. Dewar, R.N.
1913 Major A. Lawson, 2nd Drags.
1914–15–16–17 No Medals awarded.
1918 Lieutenant W. S. R. King-Hall, R.N.
1919 Colonel J. F. C. Fuller, D.S.O., Oxford & Bucks L.I.
1920 No Medal awarded.
1921 Flight-Lieutenant C. J. Mackay, M.C., D.F.C., R.A.F.
1922 Major R. Chenevix-Trench, O.B.E., M.C., Royal Corps of Signals.
1923 Captain A. H. Norman, C.M.G., R.N.
1924 Major L. I. Cowper, O.B.E., King's Own Royal Regiment.
1925 Lieut.-Colonel J. C. Dundas, D.S.O., Royal Tank Corps.
1926 No Medal awarded.
1927 Colonel H. Rowan-Robinson, C.M.G., D.S.O., R.A.
1928 No Medal awarded.
1929 Wing-Commander C. J. Mackay, M.C., D.F.C., R.A.F.
1930 Captain D. W. Boileau, R.A.S.C.
1931 Sub-Lieutenant N. McI. Kemp, R.N.
1932 Wing-Commander J. O. Andrews, D.S.O., M.C., R.A.F.
1933 Brevet Major F. A. S. Clarke, D.S.O., *p.s.c.*
1934 Lieutenant G. M. Bennett, R.N.

SUMMARY OF BATTLESHIP TYPES PROPOSED BY

Place.	*Author or Motto.*	*Proposed Displacement.*	*Proposed Speed.*
1	Lieutenant G. M. Bennett, R.N.	27,000 tons	25 knots (oil)
2	Lieutenant-Commander P. H. S. Reid, R.N. ..	27,000 tons	29.30 knots
3	Commander Carlyon Bellairs, R.N.	25,000 tons*	20 knots† (oil)
3	Lieutenant-Commander P. W. Brock, R.N. ..	20,000–25,000 tons	21 knots
Hon. Mention	Lieutenant-Commander E. W. Monckton, R.N.	27,500 tons	23 knots‡ (oil)
,,	Lieutenant N. McI. Kemp, R.N.	18,000 tons	18 knots (oil)
,,	Commander H. Hickling, R.N.	25,000 tons	25 knots (oil)
Unplaced (in order in which Essays were received)	" Mundaeque parvo sub lare pauperum coenae "	16,000 tons*	23–25 knots
	" He who puts on his armour does not boast as he who takes it off."	No details—	the maximum
	" For every why he had a wherefore "	30,000 tons	24 knots (oil)
	" Build me straight oh worthy master " ..	20,000 tons*	No definite details
	" By wise counsel thou shalt make thy war " ..	Not below 18,000 tons	Details not very definite
	" Credo quia impossibile est "	25,000 tons	—
	" Persevere "	—	Speedy
	" Majestically the battle squadron rolled " ..	26,000 tons*	21–23 knots
	" Sauce for the Goose but not for the Gannet "	30,000 tons	—
	" Pei, Naam, Tung & Si "	23,000–25,000 tons	22 knots (oil or pulverized coal)
	Average or majority	25,000 tons	24 knots (oil)

* By international agreement. † I.C. engines. ‡ Combined I.C. and Steam Turbines

COMPETITORS FOR THE GOLD MEDAL—1934.

Proposed Armament.	*Armour.*	*Remarks.*
Nine 13.5″; sixteen 4.7″. No To. tubes.	14″ belt; 16.9″ turrets; 6″ deck.	10,000′ endurance at 12 knots.
Ten 12″, eight slightly larger. Comb. Secdry. & A.A. No To. tubes.	Against 16 in. projectiles, bombs and under water.	8,000′ endurance at economical speed.
Twelve 12″*; Secondary & A.A. No To. tubes.	6″ belt	—
Eight 11″–13.5″; Combined secondary & A.A. (4″–6″). Above-water tubes.	Generally strong ..	—
Eight 13.5″; twelve 6″; four 4.7″ A.A. No To. tubes.	14″ belt; 16″–9″ turrets; 6″ deck.	17,000′ at 12 knots.
Six 13.5″; twelve 4.7″ (combd.). Two To. tubes.	11″ belt and turrets; 9″ deck.	12,000′ at 15 knots.
Twelve 14″; twenty-four 5″ combd.). No To. tubes.	12″ belt; 3″ lower deck; bomb-proof upper deck.	—
Eight 10″; twenty-four 4.75″ (combd.). To. tubes, but only after other requirements have been met.	Armour to resist 10 in. or greater bombs.	15,000′.
size allowed by Treaty is the minimum	size where numbers are	limited.
Nine 15″; ten 4.7″ A.A. No To. tubes.	Armour to resist 16 in. shell.	—
—	—	—
Retain To. tubes.	—	—
Slightly larger than 12″	—	—
Seven 9″; three-five 4″ to 5″. No To. tubes.	No details	If no consideration of numbers, then a "Hood" or "Nelson."
Eight 12″; twelve 6″; six light 4″–4.7″ A.A. To. tubes.	Against 12 in. fire; 6″–7½″ deck.	12,500′ at 15 knots.
Eight-ten 15″	Other details indefinite	—
Eight 13.5″; five or six 5.5″; four multiple pom-poms. No To. tubes.	12″ belt; 9″ deck ..	—
Eight 13.5″; twelve 4.7″ combd. secdy. & A.A. No To. tubes.	12″–14″ belt; 6″–9″ deck.	12,500′ endurance at economical speed. One or more aircraft and catapults to be provided.

EMPIRE OIL SUPPLIES IN WAR

By ANDREW AGNEW, C.B.E.

On Wednesday, 16th January, 1935.

REAR ADMIRAL G. BLAKE, C.B., D.S.O., in the Chair.

THE CHAIRMAN, on introducing the Lecturer, said that Mr. Agnew had had world-wide experience in oil development for thirty years, and as Managing Director of the Shell Transport and Trading Company he held a position of great responsibility. No one was better qualified to deal with the subject of Empire oil supplies in war.

LECTURE.

HAVING been actively concerned with petroleum in all its phases since the beginning of the present century, I am naturally extremely interested in anything pertaining to oil supplies, and especially to supplies of oil to the British Empire during a possible time of emergency. In preparing this paper, I have made my own interpretation of what should be covered under the heading, because it was obvious that to deal with the whole subject in all its details would require much greater time than is at our disposal. I hope, however, that I may at least bring out points which will give rise to further study.

Petroleum and its principal products, petrol, fuel oil, and lubricating oils are essential to the life of a modern nation in time of peace. In time of war, their importance is even greater and they are indispensable to every side of the modern military machine—indeed, oil is becoming only a little less important to the modern Army than it is to the Navy or the Air Force.

I do not think that any one here will question the fact that the safety of the Empire and the survival of Great Britain as a nation depend upon our retaining at all times the command of the sea. This phrase, in the limited sense in which I am using it, implies that the flow of imports into this country and other parts of the Empire will be enabled to continue more or less without interruption. It further implies that in order to assure the safety of any part of the Empire, we shall be in a position, in case of need, to send an army overseas without any fear that the communications of an expeditionary force with its base in this country can be endangered by enemy action. To

secure these aims it is necessary above all that the British Navy should possess the utmost degree of mobility; this implies that adequate supplies of fuel must be available wherever they may be required.

ALTERNATIVE METHODS OF SUPPLY

There are three alternative methods of securing a supply of oil products for a given territory in case of war. The first method is to produce the supply at home from native raw materials; the second is to store large quantities of oil in advance against emergency; the third is to rely on one's possession of sufficient tanker vessels and a strong enough Navy to be able to continue transporting in time of war.

EMPIRE RESOURCES

No one will deny that the first method is the most completely satisfactory when it is possible. But the only countries within the British Empire which have available resources of crude petroleum equal to or in excess of their requirements are Trinidad, Burma, and British Borneo. In 1934, these three countries held the eleventh, twelfth, and thirteenth places among the world's oil producing regions. Canada also has some indigenous production, but it is very small in relation to the consumption of that country. In Great Britain there is only a very small production of shale oil—in Scotland. The possibility of finding deposits of crude petroleum in the British Isles in commercial quantities is, of course, constantly brought under review by the British oil companies. Not only is our knowledge of the geology of these Islands continually being perfected, but the experience gained by drilling and other exploration work in various European countries, such as France, Belgium, and Germany—where analogous geological conditions exist—is constantly being applied to this country. I am sorry to say that, in the light of our present knowledge, there appears to be no prospect of finding important quantities of crude petroleum in these Islands. Very small amounts of crude oil have been produced from a well in Derbyshire, and it is quite possible that, if wells were drilled elsewhere, some oil could be found, but as I have said, there is at present no reason to expect that an oil field of any consequence underlies any part of the British Isles.

There remains to be considered the question of synthetic or substitute fuels—the possibility of getting fuel oil or petrol from coal by such processes as low temperature carbonization and hydrogenation.[1]

[1] See "Coal Products and National Defence" in the JOURNAL of August, 1932, p. 545.—EDITOR.

Low Temperature Carbonization.

The possibility of obtaining oil from coal has for many years been the dream of a number of people. A great deal of inventive skill has been expended and a great deal of money spent in the past in the effort to develop low temperature carbonization. That process is now being applied in this country, although on a very small scale as compared with the more familiar high temperature carbonization process used in the gas and metallurgical coke industries. The main product of low temperature carbonization is a solid smokeless semi-coke. About 14 hundredweights of this smokeless fuel are produced for every ton of coal carbonized, and it is sold in competition with ordinary household coal. The other products include from 15 to 20 gallons of tar and a quantity of gas. From these it is possible to obtain about 3 to 3½ gallons of good quality petrol and from 5 to 8 gallons of fuel oil.

Literally dozens of low temperature carbonization processes have been patented and in many cases companies have been floated to operate them. Only two or three of these have survived and have succeeded in producing a plant which would work satisfactorily. At the present time 99 per cent. of the marketable products being produced by this type of process are being manufactured under the patents of one company. This company is enlarging its works at the present time, and when these additions are completed, expects to have a through-put of 560,000 tons of coal a year. This would correspond with an output of about 6,000 tons of unrefined petrol and 40,000 tons of crude tar oil, from which it would be possible to produce about half that quantity of fuel oil of a sufficiently high grade to meet Admiralty specifications. Alternatively, all the tar could be hydrogenated, in which case a quantity of petrol equal to nearly 80 per cent. by weight of the tar could be produced. As the country's ever-rising consumption of petrol is now slightly over 4 million tons, it seems obvious that even with the greatest extension of low termperature carbonization that can possibly be looked for, the percentage of the total requirements of petrol and fuel oil that can be produced in this way is insignificant.

Speaking broadly, the low temperature carbonization process has no commercial attractions. The semi-coke competes directly with the best house coals, and the process depends for its financial success upon the purchase of a suitable quality of small coal at low prices, and the sale of the semi-coke at a premium above household coal prices. Obviously these two conditions cannot continue to be fulfilled if the process is ever developed on a large scale. Both coal owners and coal miners realize, and have often stated publicly that from the employ-

ment and industrial point of view, the process is unattractive. It is, in fact, not even a palliative for unemployment in the coal fields, since it would neither increase the total quantity of coal mined nor the commercial return of the collieries.

Hydrogenation

The alternative method is the production of synthetic petrol by the liquefaction, or hydrogenation of coal under pressure. The hydrogenation process was developed by the German chemist Bergius, in collaboration with the great German chemical combine I. G. Farbenindustrie, and has, during the last five or six years, been applied in Germany with technical success to the production of synthetic petrol from lignite and lignite tar. Hydrogenation has not yet been successfully applied to bituminous coal anywhere on a fully commercial scale. Coals of different kinds vary very greatly in the ease with which they can be converted into petrol, as well as in the nature of the treatment which they require. In Germany brown coal and lignite, which are not found to an appreciable extent in this country, have proved much more amenable to hydrogenation than bituminous coals, so when Imperial Chemical Industries began their work on this problem more than seven years ago, they had to make a fresh start.

In July, 1933, the Chairman of Imperial Chemical Industries announced that his Company, which had already succeeded in producing oil from coal in a small scale plant treating 15 tons of coal a day, was ready to take the next step by building, at Billingham, a plant capable of hydrogenating 400 tons of coal a day. The construction of this plant started about eighteen months ago, but it is not yet actually working. Under these conditions the process cannot be regarded as having definitely reached the fully commercial stage. This plant, when completed, is expected to have an output of 150,000 tons of petrol a year, of which about 100,000 tons will be obtained from coal and the balance by hydrogenating creosote.

This development of home-produced supplies of petrol is not being achieved without considerable financial sacrifice. The National Government passed an Act at the beginning of 1934, guaranteeing preferential treatment for a period of years, to motor spirit produced in this country from indigenous coal, shale or peat. As things stand at present, petrol manufactured from British coal does not pay any duty and therefore receives protection equivalent to 8d. a gallon; but the Government can at any time reduce this protection to 4d. a gallon, or any intermediate figure, either by reducing the tax on imported petrol,

or by imposing an excise on home-produced petrol. So long as the preference remains at its present level, the Government loses £10 a ton, or £1,000,000 for every 100,000 tons of petrol which is produced at home from coal or shale oil. A very strong and wealthy corporation like Imperial Chemical Industries, having already spent large sums in erecting their factory at Billingham for the manufacture of hydrogen, artificial manures, and a whole range of other chemical products, was able—and fortunately also willing—to invest a further £2,500,000 of its own money in installing additional plant for hydrogenation on the strength of the Government guarantee.

It is open to doubt that either Imperial Chemical Industries or other private firms will be prepared to extend the manufacture of hydrogenated petroleum with their private funds. The cost of a new plant erected on a new site, without all the facilities in the way of power, plant, steam, offices, workshops, stores, communications, etc., which were already in existence at Billingham would be at least £4,000,000 and more probably £5,000,000 per 100,000 tons of petrol produced per annum. To create hydrogenation plants capable of producing our entire domestic requirements of petrol from coal would mean an expenditure at least of £160,000,000 with a loss of tax revenue amounting to nearly £40,000,000 per annum. Even then, if the taxpayer were ready to face such an enormous capital expenditure and loss of revenue, we should still remain under the necessity of importing annually 3,000,000 tons of fuel oil and half a million tons of refined and unrefined lubricating oils.

Clearly the Government could not afford to sacrifice the whole or even the greater part of the revenue from the taxation of petrol and other oils.

It may, perhaps, be suggested that we in this country ought to take the same view as Germany is taking of the methods by which the country's safety is to be assured, and ought to make ourselves as far as possible independent of all imported raw materials at whatever cost. According to reports which have appeared in the German press, it is expected that the extensions of their hydrogenation plants now under construction will, in a full year of operation, bring the output of synthetic petrol up to a figure of 350,000 tons. But apart from the economic and financial repercussions of such a policy—which would be very serious indeed—we ought, before making up our minds that it is the right one from a defence point of view, to consider how completely different the problem which we have been considering to-day—the security of the British Empire—is from that with which a great continental country like Germany is faced in the post-war period.

To carry through a plan of making the Empire independent of purchasing crude petroleum and its products from countries outside the Empire, it would be necessary to erect hydrogenation plants at least in Great Britain, Canada, South Africa, Australia, and India, which possesses large deposits of bituminous coal or lignite—the essential raw materials—but, even if such a development were financially possible, the problem of defence would be but little nearer solution. Who is to say how or where the next war will be fought? What practical advantage would be gained by having vast factories in Great Britain and Eastern Canada to manufacture oil if the war were in, say, the Pacific Ocean.

As I shall show later, given command of the seas, there are ample supplies of petroleum within easy reach of every part of the globe. Without command of the seas, it is no more possible to transport oil from Great Britain than crude petroleum from the Persian Gulf.

But there are many other difficulties. In the first place, the plant for hydrogenation is highly complicated and delicate and peculiarly liable to damage from sabotage, or by enemy action. Concealment or camouflage would be out of the question. In the next place, the rapid expansion of hydrogenation plants would be a difficult task even in times of peace on account of the difficulty of duplicating the highly trained personnel which is required, and in war time it would be almost impossible. In any event, this type of plant can only be erected in highly industrialized countries, and it is a serious question whether all the countries I have mentioned could efficiently carry on an industry of this type while other parts of the Empire might legitimately complain that such countries had spent on a selfish endeavour to secure their own safety an enormous sum of money, a fraction of which would have sufficed to strengthen our Imperial defence forces to a point which would have made the Empire unassailable.

Petrol Substitutes.

Other possible substitutes for petrol are benzol and alcohol. The present production of benzol in this country is about 120,000 tons. Benzol, being a by-product of the carbonization of coal in gas works and coke-ovens, the production cannot be greatly increased. At present it is sold as a motor spirit assisted by the duty protection of 8d. per gallon, but household gas would not be useable if all the benzol were removed from it and nothing were substituted. Then again, if supplies of gasoil were interrupted—gasoil being a product of crude petroleum—the quantity of benzol being available as motor spirit would be much reduced.

Alcohol is the principal substitute for petroleum motor fuels. Its production on a large scale forms an important part of the agricultural policy of many European countries. In several of these countries its admixture with petrol for use as a motor spirit has been made compulsory. This policy is, however, proving exceedingly costly as the following examples will show. In France, for instance, it looks as if the quantity of industrial alcohol which will be available for use as motor spirit, after satisfying all the requirements of industry during the current year, will probably reach the figure of 280,000 tons. The cost to the State including loss of revenue on the petrol which is displaced by alcohol will, according to the best estimates that can be made at present, exceed 1,000,000,000 francs or, say, £13,000,000 at the current rate of exchange. In Germany, again, the motor fuel industry is compelled to take over annually about 150,000 tons of alcohol costing £7,750,000 sterling at current rate of exchange. The same quantity of imported petrol would have cost less than half this sum after all duties had been paid, whilst the State would have received £2,800,000 in import duties. The position in the other countries in which the use of alcohol has been made compulsory is much the same. The State, the motorist and the general taxpayer is paying enormous sums in order to prop up the uneconomic production of a home-produced fuel.

In this country, about 80,000 tons of alcohol of 95 per cent. purity are produced annually from imported molasses, of which 2½ gallons are required for each gallon of alcohol. As to the possibility of obtaining supplies of alcohol from home-produced raw materials, it is significant that 2½ acres of root crops are required to produce 1 ton of alcohol, so that the production even of a million acres would only go a very short way towards supplying our total motor fuel requirements. Then, again, for a country subsisting like ours mainly on imported food stuffs, the segregation for this purpose of millions of acres of arable land would, in war time, be entirely out of the question.

To summarize—in countries which have no crude petroleum, but which have coal, the production of substitutes for all types of oil, except lubricating oils, from native coal is a possibility, but one which can only be realized at an immense cost. The substitute oils are not all of equally good quality. Coal petrol, provided that it is efficiently refined and stabilized, is entirely satisfactory from the technical point of view. In the case of diesel oil, the coal product is definitely inferior to petroleum diesel oil, not only in calorific value but also in ignition qualities which are of the greatest importance for the smooth running of high-speed diesels.

From the cost point of view, the experience of Germany shows

that synthetic petrol manufactured from brown coal costs several times as much as imported petrol. It is impossible for me to say definitely what the petrol which Imperial Chemicals are going to produce from coal in this country will cost them, but no responsible person has suggested that it can be produced at less than twice the current cost of imported petrol.

The security shortcomings of hydrogenation plants in this country are their vulnerability from the air and the impossibility of rapid expansion in time of emergency, whilst they are necessarily confined to industrial and coal-producing districts.

Alcohol constitutes a possible supplementary source of motor fuel in tropical or mainly agricultural countries. It should, however, be disregarded entirely in countries which mainly live on imported food stuffs.

Other possible methods of propelling motor vehicles include coal gas, which can now be supplied compressed in steel containers. Such containers greatly add to the weight of the vehicle. The distance which a vehicle can travel on one charge is very limited, and it is impracticable to provide a supply of the cylinders at more than a relatively small number of refilling points. The possible use of gas is, therefore, strictly limited, but it is a resource of which use might be made for civilian transport in war time, if need arose. In countries where there are large supplies of wood and charcoal, a similar use can be made of gas-generators actually carried on the vehicle.

RESERVE STORAGE.

I now come to the second method of providing fuel supplies in war time, viz., by storing against such an emergency in time of peace. Fuel and lubricating oil can be stored for long periods without fear of deterioration at comparatively low cost; from the naval point of view, at any rate, this very cheap form of "insurance" against the danger of a temporary interruption of oil supplies is one which most certainly ought not to be neglected. The cost of providing storage in steel tanks may be taken at 18/– to 20/– per ton according to local conditions. The total cost of fuel oil in storage at to-day's prices would, therefore, work out at under £3 per ton.

Steel tankage has the advantages that it is easily and quickly erected, there is little or no fire risk owing to the fire-walls which isolate each tank completely, and almost any site is suitable. For fuel oil no additional expense or precautions are necessary, but if petrol is to be

stored, then it is desirable to have floating roofs to the tanks to reduce evaporation, vapour lines and recovery plant to deal with the lightest fractions, and foamite[1] or similar fire fighting apparatus.

There is another well tried and cheaper method of storing fuel oil to which I would draw your special attention. In California primarily, but also in other parts of the world, fuel oil is stored in huge reservoirs dug out of the ground, lined with concrete, and roofed with wooden roofs covered with roofing paper. These reservoirs can be constructed to hold up to 500,000 tons of fuel oil and some of them are as much as 15 acres in extent. The risk of fire is eliminated almost entirely by maintaining a non-explosive atmosphere in the space between the oil and the tank roof. This is done by supplying the tank with washed flue gases from an adjacent boiler plant or furnace. Any other source of carbon dioxide such as the exhaust gases from a diesel pumping plant is equally suitable. To ensure adequate protection against lightning a system of metal poles connected by wires has been devised which, in fact, means that the whole tank is enclosed in something similar to a Faraday cage and is, therefore, perfectly safe. Such reservoirs can relatively easily be camouflaged to look like lakes or cultivated fields, and can be situated well away from the coast, the oil naturally being pumped to and fro through pipelines. This type of storage is not, however, adapted to the storage of petrol.

The storage of crude oil is also quite a simple matter either in steel tanks or concrete reservoirs, although, owing to the gradual evaporation of the lighter fraction which cannot be entirely prevented, prolonged storage of crude oil is not advisable. As compared with storing petrol, crude storage has certain definite advantages, in reduced losses and fire risks, and the possibility of converting the crude into different products in accordance with the actual needs of the moment, but it is only of value in conjunction with a system of refineries and cracking plants to split up the crude into the various products.

I am strongly in favour of maintaining adequate supplies of fuel oil in the Empire, both in order to minimize the strain on the Navy and the Merchant Marine in the event of war, and so that the Empire should not be at the mercy of a successful raid by a hostile Power, or even of a complete interruption for a limited period of overseas supplies. There is no reason—other than expense, and this as I have shown is

[1] Foamite is a foam containing carbon dioxide which quickly has a blanketing effect on the fire. It is generated by introducing two separate solutions, which can be kept ready mixed in suitable containers, into a stream of water under adequate pressure.

not very serious—why stocks of bunker fuel should not be maintained in selected places within the Empire sufficient to enable the Navy to carry on for a considerable period in the event of the ordinary flow of supplies being interrupted.

Some countries, as you know, have been at great pains to develop their own refining industries and to substitute the importation of crude oil for that of refined products. The main advantage of this policy from the defence point of view is the greater ease and safety with which crude oil can be stored for long periods as compared with petrol. On the other hand, refineries are constructed with a view to a certain balance in the demand for the various products. It may easily happen that in war-time the normal balance of demand for the various products may be completely altered. I do not think that the security of this country would be in any way increased by a great development here of facilities for refining crude oil, on the same scale as has taken place in France, and is taking place in Italy. Indeed, it is possible that in war-time the advantage of being able to refine great quantities of stored crude oil instead of importing or storing petrol, lubricating oil, etc., would be more than cancelled out by the disadvantage arising from the extra demands on man-power and material, but that does not mean that the considerable facilities for refining crude oil now existing or being built in this country should be allowed to disappear.

TANKERS.

The third, and to my mind the only really practical way of maintaining our oil supplies at all times and under all circumstances, is to possess an adequate fleet of tanker vessels and bunkering stations, and a Navy which can protect them. The tanker fleet under the British Flag consisted at the end of 1934 of nearly 400 vessels aggregating 2,500,000 tons gross tonnage, and forming about one-eighth of the tonnage of the total merchant fleet. In addition there are a further thousand foreign flag tank vessels, the greater number of which would undoubtedly be at the disposal of any Power which was able to pay for them, and to protect them.

In a speech which he delivered about eighteen months ago, the present First Lord of the Admiralty[1] pointed out that every day 110,000 tons of merchandise and 50,000 tons of food reach our shores by one or other of the 80,000 miles or so of sea routes which the British Navy protects. Petroleum imports to this country amount to approximately 24,000 tons a day, so that in asking the Navy to safeguard these

[1] At Glasgow on 29th July, 1933.

supplies no new burden is imposed, but merely an extension of one which it already has to carry in any event. In fact, if I have been able to show, as I believe that I have, that the utilization of natural petroleum products is cheaper and more satisfactory than the building up of a supply of synthetic oils, then it becomes evident that the actual task of obtaining these supplies of natural oils is one which already is essential to the life of the Empire, and to these Islands in particular. Leaving the question of oil supplies entirely aside, the population of these islands would be faced with starvation within a relatively short time if the trade routes could not be kept open.

In times of peace, this country is well situated with regard to her oil supplies, both geographically and financially, notwithstanding the fact that only a very small proportion of the total supplies of the world is situated in British territory. By being well situated financially, I mean that a very considerable proportion of the world's oil production is controlled by British capital, so that a large part of what is spent on oil supplies comes back to the people of this country in wages and salaries, in freights paid to British ships, in the purchase of oil-field material, or in dividends. Geographically we are, in fact, roughly midway between the oil fields of Persia, Russia and the Eastern Mediterranean on the East, and those of the United States, Mexico and Venezuela on the West. The countries from which our oil supplies are habitually drawn include Persia, Roumania, the East and West Indies, and Trinidad.

WAR SUPPLIES.

In time of war the problem of assuring these supplies would naturally be conditioned by the strategical position, the character and localization of the war in which we were engaged, and the power of our adversaries to interfere with the normal routes taken by our commerce. The widespread distribution of oil fields throughout the world makes it obvious that under all conceivable conditions willing sellers of petroleum will always be found by purchasers who are in a position to provide transportation and protection. The prohibition of export by one or two of the main producing countries, even if the prohibition could be enforced —which is extremely unlikely—would not be sufficient to create a world oil famine.

Indeed, the whole problem of oil supplies in war is now one of transportation, and this gives the very greatest importance to the possession by Great Britain of a sufficient number of cruisers of suitable speed and armament for the protection of commerce. Granted that indispensable protection, the position at the present time is far more favourable than it was in the early stages of the late War before the

United States came in. At that time the world export situation was absolutely dominated by the United States—which to-day is not the case—as the following table shows:

World Oil Exports (all products).

	1914 (Metric Tons).	1934 (Metric Tons).
United States	6,893,000	18,973,000
Venezuela	—	17,947,000
Russia	440,000	4,133,000
Roumania	613,000	6,440,000
Persia	400,000	7,144,000
Dutch East Indies	800,000	4,800,000
Mexico	3,120,000	3,400,000

In 1914, exports from the United States were 56 per cent. of the total; to-day they represent only 30 per cent. Not only is the number of exporting countries very much larger, but the real position is much more favourable than these statistics show, because in nearly all these countries—particularly those where production is in the hands of a small number of the larger oil companies—output is being strictly controlled at present.

It will be many years before a position can arise when there will be any lack of competition among the oil supplying countries. Therefore, the only problem with which we are faced is that of the conveyance of the oil to the point at which it is required. It can be seen from the map that British naval and military forces operating in any part of the world, whether it were India, China, or the Straits of Magellan, would have behind them and on their lines of communication oil fields from which they could count on obtaining adequate supplies for the use of our armies in the field and our Navy at sea, and for use along the lines of communication. For example, in the Mediterranean, there would be no difficulty in maintaining oil supplies to our naval and military bases in that region since, even assuming the Dardanelles to be closed to shipping, supplies could easily be brought in either by the Straits of Gibraltar, or by way of Suez. Moreover, one of the two branches of the Iraq Petroleum Company's pipe line ends at Haifa in British mandated territory. Oil production in Iraq has only just begun, but if required, production there could be raised to the total carrying capacity of the two branches of the pipe line, which is about 330,000 tons a month. Incidentally, Iraq is the only country with which Great Britain has a definite bilateral defensive alliance.

We have, of course, definite commitments and interests with regard to the defence of Egypt. It is, therefore, worth mentioning that Anglo-

Egyptian Oilfields possesses producing oil fields in the Red Sea region and refines nearly enough petrol at its refinery at Suez to supply Egypt's normal requirements of that product.

Roughly, 50 per cent. of the oil supply of India in peace time is indigenous, coming from the oil fields of Burma. Of the remainder of India's requirements, the bulk is derived from Persia, Russia, and the East Indies. In war-time protection might have to be given both in the Bay of Bengal and in the Persian Gulf in order to maintain supplies at or even above the normal level. Singapore, of course, normally draws large supplies from the adjacent Dutch island of Sumatra; but there is a very valuable producing field on British territory about seven hundred miles away to the East in Sarawak and Brunei.

In the Pacific, again, the question is entirely one of transportation. Even if the oil of the Californian coast was not available there are ample supplies in Colombia and Peru.

Bunkering Stations.

I should like at this point to refer to the importance of the numerous bunkering stations which the oil industry has created along all the principal trade routes. The number of such stations, exclusive of those which are maintained for Admiralty use by our own and foreign navies, is about 230. The problem of maintaining our sea-borne commerce in war-time hinges largely on the degree of protection which could be given to these bunkering stations and to the vessels engaged in supplying them with fuel. Moreover, the problem of fuel supplies for the Navy has an obvious and intimate relation to the problem of cruising radius. I have seen it stated in the Press recently that the latest type of British destroyer has a cruising radius of 6,000 miles, or nearly four times that of the destroyers which we possessed during the War. This great increase in the cruising radius of our vessels could only have been achieved with the help of liquid fuel. The fact that these new ships can carry enough oil fuel to steam from Portsmouth to Capetown or from Vancouver to the Fiji Islands without refuelling is obviously an important point in relation to the problem of fuelling the Navy in war-time.

Standardization of Engine Types.

But here I wish to sound a note of warning. The multiplication of types of engines requiring their own special fuels and lubricating oils is apt to lead to difficulties in periods of crisis. The task of assuring our oil supplies can be greatly facilitated by official recognition of the fact that the fewer the different grades of petrol, diesel oil, fuel oil,

and lubricants that have to be supplied, the less will be the trouble caused by the inevitable dislocation of the ordinary channels of supply which takes place in war-time. The standardization of types of engine –whether petrol, diesel, or steam turbine, can play an important part in this matter. In the same way, the use of doped petrol for aeroplane engines may entail serious disadvantages in time of war. The only dope which is made and used in large quantities at the present time is tetra-ethyl lead. While it undoubtedly improves the anti-knock qualities of the petrol with which it is mixed, it involves marked disadvantages if used in more than very small proportions. Experience has shown that in a concentration of 2 cubic centimetres of tetra-ethyl lead per American gallon, the life of the valves and sparking plugs of aeroplane engines is enormously reduced. The dope is manufactured in the United States, and the patents are owned by an American company, the Ethyl Gasoline Corporation, and one of the materials for its manufacture is bromine. This is being obtained by the Ethyl Gasoline Corporation from sea water, in which it occurs in very low concentration. I mention this as an example of a product of which we might conceivably find ourselves in short supply at the outbreak of war. No doubt there may be substitutes for such products which we could manufacture here ourselves, if necessary; but we might find it impossible to start manufacturing at once owing to lack of the necessary raw materials and plant.

CONCLUSIONS.

The conclusions which may be drawn from this review of our oil resources may be summarized as follows: home supplies of oil ought to be developed wherever home production can be shown to be economic or capable of becoming economic within a reasonably short period. Beyond this point a home supply can only be created and maintained at very heavy cost. Apart from the direct financial burden involved such a course has, to my mind, two serious disadvantages. In the first place, it tends to create in the minds of those in authority an impression that the necessity for protection of trade routes has appreciably diminished. In the second place, it tends to divert expenditure away from the place where it is most needed from the point of view of the problem which we are discussing. A mere fraction of the cost of making even the British Isles independent of imported petroleum supplies would enable this country to provide defensive armaments in the way of cruisers and aircraft ample to protect not only our own supplies of food and oil, but those required for the peoples of the whole Empire.

Storage is useful and should be regarded as an important factor in the nation's state of preparedness.

The crux of the whole matter for a nation which depends, as ours does, on sea-borne commerce and sea-borne food supplies, and which has an overseas Empire to protect, is the possession of an adequate and efficient tanker fleet, and a Navy adequate to protect it.

Oil supplies are available in many different parts of the world, and can always be had by those who can " pay the money and take away the goods." No part of the British Empire is distant more than four thousand miles from its nearest oil supply, and there are no grounds whatever for singling out the question of oil supplies in war-time as though it were the " Achilles heel " of the British Empire.

DISCUSSION.

COMMODORE THE DUKE OF MONTROSE, R.N.V.R. : I am afraid I am not prepared to accept the Lecturer's view that we should be largely dependent on imported oil. It was only in the middle of the late War that we realized the very grave situation in which we stood. In the early days of our history our Navy gained our great supremacy by the use of coal, and it was only when we turned from coal to oil that we threw away the advantage we possessed in the utilization of our own fuel resources. As things stand to-day the whole of the Navy is dependent on oil, as also is the Air Force in the form of spirit, while the Army for its mechanization is also dependent on oil. For that matter, every munition factory in the land is dependent on lubricating oil. If the supply of oil failed every wheel in the country would have to stop. Is it safe and right that this country should be dependent on the importation of oil ? No, it is not right ; we are sitting on a bomb.

The time has come when we must increase the production of home supplies of oil. I have made some study of low-temperature carbonization, and I do not accept the view that it is or must be a non-paying proposition. Only one company at present is efficiently making oil from coal—the Low Temperature Carbonization Company—and that has declared a substantial profit. The production of oil by low-temperature carbonization increased by 47 per cent., and the yield of oil by 72 per cent., in this country last year. As the technique improves, the chances of making our home supplies of oil a possible and paying proposition are growing more certain every day.

I do not say that we shall make at home the whole of the oil that we require, but if I were a " Hitler " I would put all importing oil companies on a quota and encourage a supply of oil made at home. There are many thousands of miners walking the streets to-day receiving the dole for idleness. If mining coal were increased by twenty million tons in order to produce oil it would result in fifty thousand miners being taken off the dole. The unemployed miners at present cost this country a very large sum, and if they were fully employed they would represent an immense gain in the nation's purchasing power, and home trade would be stimulated. It is home trade that is increasing the prosperity of the country to-day ; our exports are not doing so in anything like the same ratio. Therefore, from the point of view of trade as well as of defence, it would be a paying proposition for this country to encourage low temperature carbonization or the production oil from coal.

BRIGADIER-GENERAL W. F. SWINEY: Can the Lecturer tell us how it is that while at the end of the War benzol was being sold at ninepence a gallon—I presume at a profit—it is now 2s. 2½d., and yet it is not being used commercially?

ADMIRAL SIR REGINALD TUPPER: With regard to the storage of oil so as to secure it against air attack, has the possibility been considered of using old tanker steamers, sunk in some suitable place, where the oil could be available for pumping into ships as required? Again, I believe only the upper part of the tube of underground railways is used for the rails, and there is nothing underneath; could not the lower part be used for storing oil and petrol?

It seems to me that it is absolutely essential to have our oil stored in such a way that it is more or less immune from possible damage from the air. At present there appears to be no plan for removing to safety the oil fuel stored in the open at such places as the Thames Estuary, Southampton Water, Plymouth, Liverpool, and the Tyne.

CAPTAIN E. ALTHAM, R.N.: While on the subject of ready-made underground storage for oil, may I suggest that attention might be given to the possibility of using worked-out coal and other mines which exist in many parts of the country for storing oil in nests of large pipes.

LIEUT.-COLONEL O. L. MATHIAS: I think it is worth while drawing attention to the extraordinarily cosmopolitan character of certainly one, and to a lesser extent another, of the great oil fields on which we have to depend in war. We have heard about the new oil fields in Northern Iraq and the pipe line across to the Mediterranean: here we have the oil field in a foreign country—for Iraq is an independent sovereign State—and the pipe lines pass through six different territories (including Iraq) of different nationalities under different forms of government. Both the pipe lines come out at ports in mandated territory. So far as I am aware, the position of a seaport in a mandated territory in connection with cargoes which might be regarded as contraband of war has not yet been defined. The Iraq Petroleum Company is itself an international company, financed and managed by interests in England, France, America, and Holland; and it is not, moreover, a distributing company—that is to say, it has no tankers of its own as the Anglo-Persian Company has. It produces the oil and runs it through the pipe line to Tripoli and Haifa; once there the company's duty is done.

A great many people are under the impression that a mandated territory is on the same footing as a colony belonging to the Mandatory Power. That is not the case. For example, whether an orange grower in Jaffa wants to send his fruit to England or a British trader to send goods to Palestine, exactly the same import duties have to be paid as in the case of the German, the Italian, or any other foreigner. The result is that British firms find it extremely difficult to get a footing for their products in Palestine, because they cannot compete with the wages and subsidized industries and shipping of their continental rivals. It would be an interesting position if a mandated territory in war-time started sending cargoes regarded by the enemy as contraband. Mandated territories, it should be remembered, did not exist in the late War.

With regard to the Anglo-Persian Company, the position is not quite the same. There we still have the oil supplies in a foreign country, but they are worked by a British company who have their own fleet of eighty or ninety tankers. Up to a year or so ago, law and order in the Gulf was maintained by British sloops; but more recently the Persian Government has acquired a flotilla of six fast and modern

small craft well armed and officered by Italians. When considering contraband of war, the presence of such a force could not in future be entirely overlooked.

There is also the possibility of our being involved in a war in which one or other of the countries from which these oil supplies are drawn had declared itself neutral; when we recall the fact that the I.P.C. pipe line passes through six different territories, it is clear that rather a difficult situation might arise. Perhaps the Lecturer could remark on those points.

THE LECTURER:

The Lecturer, in reply said: I am not able to answer completely all the questions raised, but I will do my best. The Duke of Montrose deplored our dependence on imported oil. Perhaps it was my fault if I did not make it clear that I also deplore that, and I think that in my lecture I mentioned that home supplies of oil ought to be developed wherever home production can be shown to be economic or capable of becoming economic within a reasonably short time. Perhaps, therefore, we differ only in degree. He challenged my statement with regard to the paying basis of low-temperature carbonization. I believe I know the company to which he is referring. The record of that company is that it has paid one dividend of 3 per cent. since 1904—i.e., in thirty-one years!

He suggested that if he were a "Hitler" he would put all the "combines" or "trusts" on a quota. I can assure him that nothing would please them better. At present they are living a hand-to-mouth existence under the most terrible competition; they never know whether they will be able to sell supplies to-morrow. A Hitlerite scheme for a quota would receive the greatest welcome.

The point was raised: why not make oil from coal and thereby help the miners? I doubt very much whether anything that could be done in the way of getting oil from coal would help the miners. I suggest a more efficient and cheaper method would be to mine the coal, and throw it into the sea, and buy oil: that would be cheaper for the country, and better for the revenue of the country, and would allow us to spend more money on our military and naval resources. There are other paying ways of helping the miner and of stimulating the production of coal in this country, and I entirely agree that it should be done to the greatest possible extent, and it can be done if only it is tackled properly.

Then we were told that home trade is the only thing we need worry about. I must disagree entirely with that view. It is true that this country has progressed enormously owing to her home consumption, but if any in power or authority in this country imagines that we can live by home consumption alone, then I am afraid we are a dying nation. We have lived by export, by sending our people and our goods abroad, and I hope we shall always do so.

A question was asked why benzol is not being used much now. I am not very conversant with that, and I can only suggest that benzol, which at one time was 9d. a gallon, and is now much dearer, is not used because people do not like it.

BRIGADIER-GENERAL SWINEY: I think they do not like the price.

THE LECTURER: Well, I have not made it! Benzol is a product manufactured by our friends, and why they should charge the same price as imported benzol and at the same time get the full benefit of the 8d. per gallon tax I cannot say.

Something was said about providing storage for oil from air attack. The suggestion that by sinking tank steamers we could provide such storage is very novel and interesting, but I hesitate to express an opinion on it; at first sight

I should say that it is not very feasible. To begin with, it would be necessary to have old tank vessels which were oil-tight—even in a new vessel that is not a very easy job, and in an old vessel it might prove extremely difficult. The question of connections, pumps, and so on would also be very complicated. Tube station storage I would rule out. I believe the worked-out coal-mines idea offers a great possibility, but against it is the enormous lifts which would be required and the great amount of pumping. On the whole, I think that the storage of liquid fuel in large reservoirs suitably placed, or even in steel tanks, in some well chosen situation, would be the solution. That would not only be better than these other suggestions, but in the end would work out cheaper, because you could choose your site, and your connections and pumping arrangements would be very much simplified.

The various points made about the Iraq fields and their control were all absolutely correct. The Iraq Petroleum Company is, roughly, 25 per cent. British, 25 per cent. British and Dutch, 25 per cent. American, and 25 per cent. French. It is also true that the pipe line to the two points, Tripoli and Syria, crossing the Eastern Mediterranean, goes through five different countries. I can assure you as one who has had a good deal of practical experience, not only in the development of the facilities in this part of the world, but in the getting of the concessions and the handling of the field from the beginning, that these different nationalities represent by no means an easy task. The business can well be described as a tower of Babel, and I agree that all the difficulties which have been suggested might easily arise.

As to what the position would be in respect to oil as contraband of war, I am not able to express an opinion, but I will say this, that I had a good deal to do with the supply of oil during the late War, and with the supply of oil from neutral countries—in fact, I can say I spent most of my time in connection with that problem. I found no difficulty whatsoever; it was possible to get supplies of oil from neutral countries without disability and delay. It was also possible to get it, mainly because of the connections which the various oil companies have with those in neutral countries, without exorbitant charges. Therefore, subject to anything that people who are more capable of talking on this contraband situation may have to say, I do not believe that it is a real obstacle to our getting any amount of supplies of oil in time of emergency.

THE CHAIRMAN:

I think Members will agree that we have had a very instructive lecture by Mr. Agnew. The Duke of Montrose, in his very characteristic and breezy manner, which is always refreshing in this theatre—I have heard it before—made some very provocative statements which I rather anticipated other Members would take up and comment upon, if not repudiate. But they did not do so, and it was left to Mr. Agnew to iron out a few creases in the heads of those who shout loudly that the Navy should go back to coal, or that we should produce from coal all the oil that is required in this country.

This lecture to-day is very interesting to me, as I have a certain amount of the responsibility for the provision of oil fuel for the Navy. It is also interesting for the logical conclusion which the Lecturer has arrived at, quite independently. His conclusion is as follows: if petroleum products are essential not only to our naval forces but also to the life of this country, and production of oil from coal in this country is uneconomic and incapable of yielding the amount required, then we must regard oil as in the same category as food and other raw materials on

which we depend for our existence. We must maintain that supply in peace and secure it in war. In peace naturally it flows quite easily; in war it may be obstructed. To meet this obstruction we must rely on our defence forces, and particularly the Navy, to maintain the security of our lines of sea communications. Therefore, as the Lecturer has said, we require adequate naval forces, and in particular an adequate number of cruisers on our trade routes. To some extent we can safeguard this supply of oil in an emergency by the provision of storage at strategical points during peace-time, and in addition to that we can so organize our tanker tonnage that it can meet the additional requirements which will undoubtedly arise. From the figures the Lecturer has given us I do not think the position as regards tankers can be described as very satisfactory. Fuelling stations have to be protected in time of war, and we rely for that protection on the Army and the Air Force. The transportation of the fuel from the sources of production to where it is required is, of course, the responsibility of the Navy, assisted by the Air Force.

Our conclusion, therefore, is that to maintain oil supplies in war our defence forces must be adequate.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

SEDGEMOOR—1685

THE BIRTH OF SOME FAMOUS REGIMENTS

By MAJOR T. J. EDWARDS, M.B.E., F.R. Hist. S.

THE year 1935 has a special interest for some of our older regiments in that it marks the 250th anniversary of their birth in the troublous times of 1685, a few months after James II had ascended the throne. Although the first regiments of the Standing Army were established by Charles II, on 26th January, 1661, and a few more regiments were added to these during the next twenty years, it was not until 1685 that the first large permanent augmentation took place. It was a revolt of a few religious fanatics that led to the foundation of the Standing Army in 1661 and it was a larger revolt, inspired by the religious question, that gave rise to its first considerable expansion.

From the time of the Reformation down to the failure of the 1745 Rebellion, which shattered the hopes of the Jacobites, religious questions were very prominent in British politics Originally only Roman Catholicism and Protestantism were involved, but later Presbyterianism and Non-Conformity in general became matters of equal importance. When Charles was invited to return to England and occupy the throne, he was secretly a Roman Catholic, but openly he scoffed at all religions. In the Declaration of Breda, which was his reply to the invitation, he stated that " We do declare a liberty to tender consciences ; and that no man shall be disquieted or called in question for differences of opinion in matters of religion which do not disturb the peace of the Kingdom." As a political move this pronouncement was a complete success and did much to ensure a minimum of opposition to his Restoration. But once Charles was firmly seated on the throne he paid little attention to the liberty of " tender consciences." The passing of " The Act of Uniformity " in 1662, the " Conventicle Act " in 1664, and the " Five Mile Act " of 1665 are specimens of his breaches of the Breda Declaration. But the worst example was his secret agreement with Louis XIV of France under which he promised to bring about the predominance of Romanism in England, for which he was to receive £200,000 a year from Louis. The scheme, however, failed.

The other chief actor in the drama was James, Duke of Monmouth. Whilst Charles II was in exile at the Hague during the Commonwealth, he had fallen in love with Lucy Walters, a pretty Welsh girl who became his mistress and bore him a son on 9th April, 1649. Doubts were cast upon the paternity of the child, but Charles recognized him as his son and placed him under the care of Lord Crofts, from whom he took the name of James Crofts. At the age of fourteen he was created Duke of Monmouth and at sixteen he married Anne Scott, Countess of Buccleuch, the wealthiest heiress of Scotland. Thenceforward he took the surname of Scott.[1]

Monmouth became very popular, due to his being a Protestant, and he was usually referred to as " The Protestant Duke " in opposition to James, Duke of York, who was the Roman Catholic Duke. As time went on the country generally viewed with dismay the prospect of James's succession on the death of Charles. To thwart this, efforts were made to persuade Charles to legitimize Monmouth by a declaration of his marriage to Lucy Walters. But the King replied saying that, much as he loved the Duke, he would rather see him hanged at Tyburn than own him for his legitimate son.

Monmouth had a real liking for soldiering and soon gained a reputation in that sphere. In the war against Holland he commanded the English auxiliaries and proved himself a gallant soldier. In 1679 he commanded the English force which was sent to Scotland to put down the rising of the Covenanters, whom he routed at Bothwell Brig (22nd June, 1679). This achievement enhanced his reputation greatly and he was hailed as a conquering hero on his return to England. His popularity was a source of great annoyance to James and also to Charles, who was becoming ever bolder in championing the Roman Catholic religion whilst Monmouth was hailed everywhere as the champion of Protestantism. Matters eventually became so strained that Charles at last deprived Monmouth of all his offices and ordered him to leave the country. This he refused to do, but instead made " progresses" in the West of England, visiting his chief supporters. Later on, in order to escape from difficulties, he fled to Holland.

Charles II died on 6th February, 1685, and was succeeded by his brother, James II. At this time there were many English and Scottish Protestant and Presbyterian exiles in Holland who lost no time in hatching a plot to overthrow the new Catholic King and place a Protestant on the throne in his stead. A meeting was arranged to take

[1] During the rebellion in 1685 he was derisively referred to by the men of the Royal Army as " Gaffer Scott."

place at Rotterdam,[1] and Monmouth and the Earl of Argyll were invited to attend. It was arranged that two expeditions should land in England and Scotland simultaneously: the former to be led by Monmouth and the latter by Argyll. In order to maintain the union between them it was agreed that two Englishmen should accompany Argyll—Ayloff and Rumbold; and two Scotsmen should similarly accompany Monmouth—Fletcher of Saltoun and Robert Ferguson, known as "the plotter." The venture was badly organized for no steps had been taken to secure promises of support when the respective leaders arrived in Great Britain. Argyll landed in Scotland on 17th May, 1685, and was promptly taken and executed. Various circumstances detained Monmouth, but he eventually landed at Lyme in Dorset on 11th June, 1685.

James's first Parliament met on 19th May, 1685, and he called upon it to grant him the same revenue for life as had been enjoyed by the late King, viz. £1,900,000 a year. He concluded his speech by informing them that he had just received news of Argyll's landing in Scotland and therefore his revenue should be granted without delay. His request was granted, and when news of Monmouth's landing was received Parliament granted him an additional sum of £400,000 and passed a bill for the security of the King's person. A Bill of Attainder against Monmouth was passed through both Houses of Parliament, and a reward of £5,000 offered for his body, dead or alive.

The selection of Lyme as his landing place was a good move on Monmouth's part, for he was popular in the locality and the local Militia were well-disposed towards his cause.[2] He was attended by Lord Grey of Work and over eighty exiles and their attendants. He raised his standard and published a ridiculous declaration which had been composed by Ferguson, styling James a usurper and charging him with the burning of London and other atrocities. Numbers were drawn to his standard and on the 15th June he marched northward from Lyme at the head of four thousand men.[3] Every man wore a "green bough" in his hat, which thenceforward became the distinguishing mark of the rebels The Duke of Albemarle concentrated the Militia of Devon and Somerset at Axminster to oppose him, but they refused to fight. At Taunton he was received with acclamations and

[1] Some say Amsterdam where Monmouth was in hiding from the Spanish authorities.

[2] When the drums were beaten to call out the Militia to resist Monmouth at Lyme only one man turned out and, finding himself alone, joined Monmouth, a proceeding for which he was hanged after Sedgemoor.

[3] Daniel De Foe, the author, joined Monmouth's force.

presented with a splendid stand of Colours, and twenty young ladies presented him with a sword and a pocket Bible. Here he caused himself to be proclaimed King on the 20th June, and in proof of his royalty touched for the King's Evil. He then proceeded to Bridgewater, intending to cross the Avon at Bath and advance against Bristol. Heavy rain now set in and the routes were soon converted into lanes of mud.

Meanwhile James had taken measures to suppress the rebellion.[1] The only regular troops in the West of England at that time were some companies at Plymouth. The immediate need was for cavalry which could move speedily westward to get into touch with Monmouth's force, hold it in check until the infantry arrived, and give support to the local Militia. Orders were given on 13th June, i.e., the day the news of Monmouth's landing reached London, for some of the King's troops to concentrate at Salisbury under the command of John Churchill [2]—later the great Duke of Marlborough. This force consisted of four troops of The Blues, two troops of The Royal Dragoons, nine companies of infantry, and a train of artillery. The main object was to prevent Monmouth from securing Bristol, which was then the second city in the kingdom. Pushing on with the cavalry, Churchill reached Bridport[3] on 17th June, on which day Monmouth was at Taunton, 24 miles to the North-West. Disregarding the fatigue of his men and horses, he followed hot on Monmouth's tracks, in order to harass and delay the rebels and thus give time for the Duke of Somerset to secure the Avon with the militia of Gloucester, Hereford, Monmouth, and Somerset, and for the arrival of Lord Feversham, who had been appointed Commander-in-Chief and was moving westward with a force of Regulars. On the 20th June, Churchill's patrols had a skirmish with the rebels between Chard and Taunton and the place where this occurred is still called "Fight Ground." Monmouth continued towards Bristol and as he moved via Bridgewater, Glastonbury, and Shepton Mallet, he found Churchill's patrols hanging on his flank.

On 24th June, Monmouth's advanced guard reached the Avon at Keynsham, between Bath and Bristol, where a bridge had been partially destroyed by the Militia. The next day his main body came up and was about to cross the repaired bridge when it was suddenly attacked by a troop of The Blues under Major Oglethorpe. This made Monmouth

[1] He issued numerous Commissions for the raising of regiments and independent troops and companies—*vide* p. 305.

[2] James's original intention was that Churchill should command all his troops taking part in the expedition, but Churchill had hardly left for the West of England when James superseded him by Lewis Duras, Lord Feversham, a French Protestant noble, nephew of the great Turenne.

[3] Churchill was now operating among the scenes of his childhood.

abandon his attack on Bristol and he hurried on to Bath; but, on being refused admittance, he turned southward to Phillip's Norton, then on through Frome to Bridgewater. At Frome he learned of Argyll's fate which made him very despondent. Had he been able to cross the Avon he might have spread the revolt in the Severn Valley where he expected assistance, but in this he had been thwarted. His despondency increased when he saw that no nobility or gentry had declared in his favour, and he began to regard his cause as hopeless. The knowledge that a reward of £5,000 for his body, dead or alive, had been offered, put him constantly in fear of assassination. It was proposed to disband his rebel army and that he and his friends should escape by sea, but this course was vigorously resisted by Lord Grey, and the army was accordingly led back to Bridgewater. Monmouth had many friends in London, and soon after landing he sent two agents to the Metropolis to lead a projected rising as soon as James had denuded it of troops. The King, however, had countered this by arresting many known sympathisers of the rebel cause. Nevertheless, the possibility of such a rising was now the only ray of hope for Monmouth and his counsellors.

Churchill joined Feversham on 26th June, and Monmouth's fate was now sealed—his defeat was only a question of time. The rebel rearguard was overtaken at Phillips' Norton, and a skirmish took place. Feversham, however, would not back up his energetic subordinate, Churchill; so the rebels were allowed to draw off and continue their march to Bridgewater. By proceeding leisurely Feversham reached Weston Zoyland, a village on the Southern edge of Sedgemoor,[1] on the 5th July.

On the 5th July, Monmouth could see the tents of Feversham's force spread out about Weston Zoyland, some four miles away, and he now had to decide quickly what to do. Three courses were open to him—to attack Feversham in camp, to await to be attacked by him, or to

[1] In trying to give an accurate account of the Sedgemoor Campaign a difficulty arises because no two authorities agree entirely. Fortescue appears to have recognized this and readers will look in vain in his history of the British Army for an account of this Campaign; in fact, he dismisses the subject in a footnote which refers the reader to Macaulay's account. (Fortescue, Vol. I, p. 299). But a lot of research has been carried out since Macaulay wrote his history. One of the best general accounts is that by Maurice Page (Bridgewater Booklets, No. 4), but this requires amplification for military readers. Mr. Winston Churchill in his recent Life of Marlborough used Page's account. Other good accounts are Lord Wolseley's in his Life of Marlborough, C. T. Atkinson's in the "History of The Royal Dragoons," Hamilton's in the "History of the Grenadier Guards," Leask and McCance in the "History of The Royal Scots," Davies in the "History of The Queen's (2nd Foot)."

retreat and thus avoid fighting altogether. He decided to adopt the last and to make a dash northward for Bristol. In order to mislead spies, he openly announced his intention of defending Bridgewater and later in the day issued orders for a retreat southward to Taunton. But Churchill was not deceived by these devices for he had learnt that Monmouth was eager to obtain a large quantity of horses and saddlery, which indicated a swift move somewhere. Just as Monmouth was crossing the town bridge to join the rebel host concentrated in Bridgewater Castle Field in readiness for a move, fate met him in the shape of a local farm labourer named Godfrey who had just arrived from near Feversham's camp. He gave Monmouth an exact account of the dispositions of the Royal Army, and said that the troops were indulging in drunken revelry, that no efficient protective measures had been adopted, and that no steps had been taken to improve the defence of the position. This intelligence gave Monmouth the impression that his efforts to mislead Feversham had been successful. He questioned Godfrey on various points and went with him to the tower of Bridgewater Church from where, with the aid of a telescope, he was able to see the dispositions of the Royal Army. He recognized his old regiment, the 1st Foot Guards—now the Grenadier Guards—and Dumbarton's, and commented with a sigh, " I know those regiments and they will fight : if I only had them I should not doubt of success."

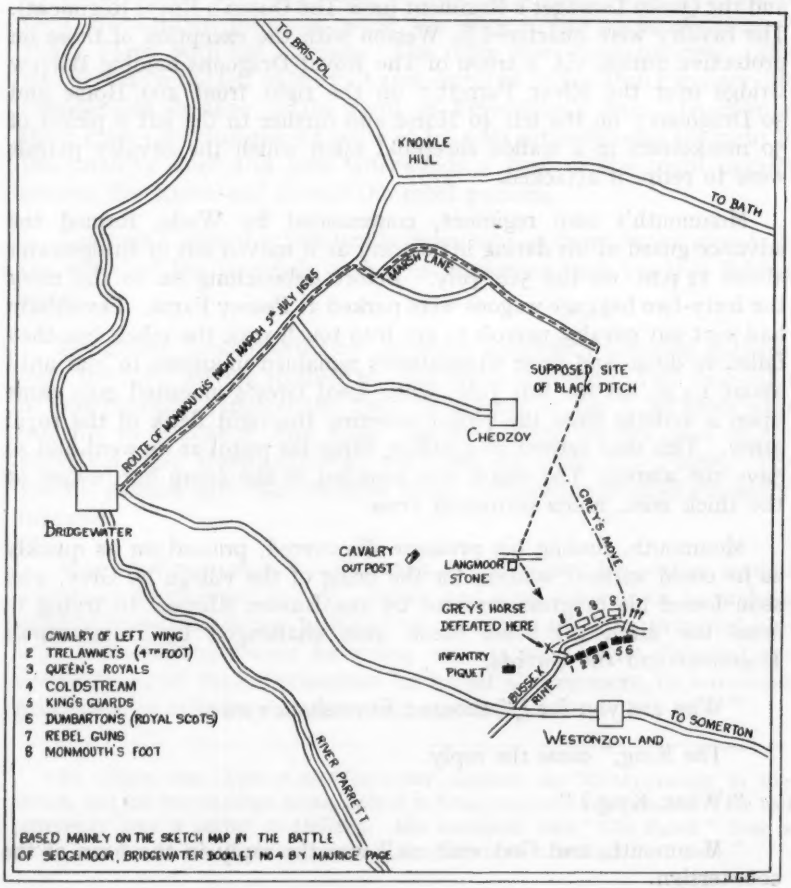
Descending from the tower he summoned his officers and proposed an attack upon the royal army that night. This was agreed to. The plan was to make a wide detour to the North-East and then turn to fall upon Feversham's right flank and rear. The mounted troops were to set fire to Weston Zoyland and, whilst the royal army was thus thrown into a panic, the Foot, led by Monmouth himself, would fall upon them from the front. The countersign was " Monmouth, and God with us." The plan was well conceived and it nearly succeeded. When the full moon had risen high on that Sunday night Monmouth's force[1] moved out silently from Bridgewater towards Feversham's camp

[1] The detail of his force is as follows :—

A small mounted guard of about	40 men.
Lord Grey's Horse	600 men.
The Red Regt. commanded by Col. Wade	800 men.
„ White „ „ „ „ Foulkes	400 men.
„ Blue „ „ „ „ Bassett	600 men.
„ Yellow „ „ „ „ Matthews	500 men.
„ Green „ „ „ „ Holmes	600 men.
Coy. of Foot from Lyme Regis	80 men.
Total	3,620 men.

—the cavalry led by Lord Grey, the foot by Monmouth. Godfrey was the guide, and the track followed is still known as War Lane. The night was still, a heavy mist began to rise and the weirdness of the situation had some effect upon the untrained rebels, who would not keep order. To preserve the utmost silence Monmouth decreed that if any man uttered a sound he was to be stabbed to death instantly by his nearest comrades.

The historic Sedgemoor stretches East and South-East from Bridgewater. In the XVIIth century it was largely a peat moor, usually



flooded in winter. Attempts to drain it had been made by cutting broad and deep ditches, locally called " rhines," to carry the water to the River Parrett. These rhines were sometimes as much as thirty feet wide and quite unfordable, owing to the presence of deep mud at the bottom.

When Feversham arrived at Weston Zoyland he took up a position behind the Bussex Rhine with his infantry facing North and his guns facing West. In the infantry line the regiments, either in whole or in part, stood in the following order: from the right, Dumbarton's (now The Royal Scots), 1st Foot Guards (now Grenadier Guards), Coldstream Guards, Trelawney's Regiment (now The King's Own Royal Regiment), and the Queen Dowager's Regiment (now The Queen's Royal Regiment). The cavalry were quartered in Weston with the exception of those on protective duties, viz. a troop of The Royal Dragoons holding Barrow Bridge over the River Parrett: on the right front 100 Horse and 50 Dragoons; on the left 40 Horse and further to the left a picket of 50 musketeers in a walled sheepfold upon which the cavalry patrols were to retire if attacked.

Monmouth's own regiment, commanded by Wade, formed the advance guard of his daring little army as it moved out of Bridgewater about 11 p.m. on the 5th July. Before debouching on to the moor the forty-two baggage wagons were parked at Peasey Farm. Feversham had sent out cavalry patrols to get into touch with the rebels but they failed to do so and their whereabouts remained unknown to him until about 1 a.m. on the 6th July, when Lord Grey's mounted men came upon a vedette from the picket covering the right flank of the royal army. This man retired at a gallop, firing his pistol as he went and so gave the alarm. The alarm was sounded in the camp but, owing to the thick mist, much confusion arose.

Monmouth, finding his presence discovered, pressed on as quickly as he could without waiting for the firing of the village by Grey, who soon found his progress arrested by the Bussex Rhine. In trying to cross the ditch the rebel horse were challenged by Dumbarton's Regiment and the Guards.

" Who are you for? " shouted Feversham's men.

" The King," came the reply.

" What King? "

" Monmouth, and God with us," was the reply in the form of the countersign.

Feversham's infantry thereupon poured in a volley which emptied many saddles and threw Grey's troopers into confusion. Panic-stricken they turned westward and dashed across the front of Monmouth's foot, and demoralisation quickly set in. Stragglers coming forward were met by the flying cavalry and joined in the stampede under the impression that all was lost, and numbers returned to their homes.

Feversham was in bed when the alarm sounded in his camp, but Churchill was awake and alert and took charge of affairs. He put himself at the head of Dumbarton's, and formed it ready to meet the attack. The rebel foot came on in complete disorder and wasted their ammunition by firing mostly over the heads of their opponents. About 2.15 a.m. their ammunition gave out while the reserve was 2½ miles away at Peasy Farm, with the baggage. The three rebel guns, however, came into action on the left of the foot and, directed by the Dutch gunner, did considerable damage to the right of Feversham's line. To counter these guns Churchill moved some of his own artillery onto the right of the infantry line[1] and soon afterwards a part of the royal cavalry crossed the Rhine and routed the rebel gunners.

The battle was now practically over, and as dawn broke crowds of the wretched beaten rebels were seen streaming back towards Bridgewater.

Monmouth, accompanied by Grey and about fifty troopers, galloped from the field, leaving to their fate his brave followers. Two days later he was captured, and on the 13th July, both he and Lord Grey were brought to London. The King pardoned Grey for his part in the Rebellion, but Monmouth was beheaded on 15th July, 1685. The Bloody Assizes, with the infamous Judge Jeffreys as the chief character, followed.

This brief campaign left its mark on the Army by adding several regiments which exist to-day. James had been determined to make a permanent augmentation to his forces, and this rebellion provided him with a convincing reason for doing so. As soon as he obtained the necessary grant from Parliament he issued Commissions to numerous gentlemen to raise regiments, troops and companies.

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[1] Dr. Mews, then Bishop of Winchester, assisted the Master-Gunner in this action, and his own carriage horses helped to bring the guns into position. He had previously been a soldier in Holland. His nickname was "Old Patch" from a patch he wore on his cheek to cover a wound received in action.

Of the regiments raised to resist the rebellion, the following still remain :—

Regiment.	*First Colonel and Date of Commission.*	*Present Title.*
	HORSE.	
The Queen's Regiment of Horse.	Sir John Lanier. 6th June, 1685.	1st King's Dragoon Guards.
The Earl of Peterborough's Regiment of Horse.	Henry, Earl of Peterborough. 20th June, 1685.	The Queen's Bays (2nd Dragoon Guards).
The Earl of Plymouth's Regiment of Horse.	Thomas, Earl of Plymouth. 25th July, 1685.	3rd Dragoon Guards : amalgamated in 1922 with The Carabiniers (6th Dragoon Guards) to form the present 3rd Carabiniers (Prince of Wales' Dragoon Guards).
The Earl of Arran's Regiment of Horse.	James, Earl of Arran. 28th July, 1685.	4th Dragoon Guards : amalgamated with the 7th Dragoon Guards in 1922 to form the present 4th/7th Dragoon Guards.
The Earl of Shrewsbury's Regiment of Horse.	Charles, Earl of Shrewsbury. 29th July, 1685.	5th Dragoon Guards : amalgamated with The Inniskillings (6th Dragoons) in 1922 to form the present 5th Inniskilling Dragoon Guards.
The Queen Dowagers' Regiment of Horse.	Richard, Viscount Lumley. 31st July, 1685.	6th Dragoon Guards—see under Earl of Plymouth's Horse (above).
	DRAGOONS.	
The Queen's Regiment of Dragoons.[1]	Charles, Duke of Somerset. 2nd August, 1685.	3rd The King's Own Hussars.

[1] Some troops of this regiment had been raised in June, 1685, by reason of which it secured its precedence over the next regiment below it—4th Hussars.

Colonel John Berkeley's Regiment of Dragoons.	John Berkeley. 17th July, 1685.	4th Queen's Own Hussars.
	FOOT.	
The Royal Regiment of Fuzileers.	George, Lord Dartmouth. 11th June, 1685.	The Royal Fusiliers (City of London Regiment).
The Princess Anne of Denmark's Regiment of Foot.	Robert, Lord Ferrers. 19th June, 1685.	The King's Regiment, (Liverpool).
Colonel Henry Cornewall's Regiment of Foot.	Henry Cornewall. 19th June, 1685.	The Norfolk Regiment.
The Earl of Bath's Regiment of Foot.	John, Earl of Bath. 20th June, 1685.	The Lincolnshire Regiment.[1]
The Duke of Beaufort's Regiment of Foot.	Henry, Duke of Beaufort. 20th June, 1685.	The Devonshire Regiment.
The Duke of Norfolk's Regiment of Foot.	Henry, Duke of Norfolk.[2] 20th June, 1685.	The Suffolk Regiment.
The Earl of Huntingdon's Regiment of Foot.	Theophilus, Earl of Huntingdon. 20th June, 1685.	The Somerset Light Infantry (Prince Albert's).
Sir Edward Hales' Regiment of Foot.	Sir Edward Hales, Bt. 22nd June, 1685.	The West Yorkshire Regiment (The Prince of Wales's Own).
Sir William Clifton's Regiment of Foot.	Sir William Clifton, Bt. 22nd June, 1685.	The East Yorkshire Regiment.

[1] The centre badge on the Regimental Colour of The Lincolnshire Regiment comprises two clarions, a clarion being a crest of the first Colonel of the regiment.

[2] The centre badge on the Regimental Colour of The Suffolk Regiment contains a " branch of oak " like that borne in the Duke of Norfolk's armorial bearings.

THE TERRITORIAL ARMY

By LIEUTENANT-COLONEL J. K. DUNLOP, M.C., T.D.

On Wednesday, March 20th, 1935.

LIEUTENANT-GENERAL SIR CHARLES BONHAM-CARTER, K.C.B., C.M.G., D.S.O., in the Chair.

THE CHAIRMAN, in introducing the Lecturer, said that Colonel Dunlop was commanding the 12th London Regiment of Rangers; he was also in charge of the Publicity Section of the Territorial Association of London. He had made a very close study of the Territorial Army, not from a local point of view but from the broadest possible point of view.

LECTURE.

WE all know that there are grave problems which confront the Territorial Army to-day, though we may each have our own view as to the relative importance of these problems. It is five years since a discussion of this question was held in this Institution. The passing years have not been without influence, and I believe that we may regard the interest now being shown in the subject as symptomatic of the increasing responsibilities laid on the Territorial Army.

There have been certain days or events in history which have marked definite stages in the evolution of the Auxiliary Forces. Without going back to Napoleonic times, we may call to mind the Longacre Indignation Meeting of April, 1859, or that afternoon of 15th December, 1899, when the Lord Mayor drove in his carriage from the City to Pall Mall to see the Commander-in-Chief, Lord Wolseley, in order to offer the formation by the City of London of a complete volunteer battalion for service in South Africa. Similarly we may count the passing of the Territorial and Reserve Forces Act on the 2nd August, 1907, and of the Territorial Army and Militia Act of the 17th August, 1921, as dates of capital importance.

It may seem an exaggeration to compare present events with these momentous days of the past. Yet I do indeed believe that this meeting itself marks in some way the passing of an era. Still before leaving the consideration of the past, and before we review in detail the problems of the present, may I enter one *caveat* in the interests, perhaps, of pure historical accuracy. At a time like the present, when changes are

suggested and when the old order seems to be breaking up, there is a tendency, human and indeed highly natural, to cast longing eyes backwards towards an unruffled past. There is a temptation—and historians themselves are not immune therefrom—to attempt to pinpoint the golden age. Yet under the cold light of critical history our selected moment, be it the revival of learning, the spacious days of Queen Elizabeth or the great days of the Constitutional Force, will prove an intangible chimera. What in our imagination was a set, well-ordered canvas shows, in fact, as a living image, ever in a state of flux, an ever-changing form in the march of time.

Within the history of the Auxiliary Forces we may, however, count certain definite chapters. From 1859, the formation of the Volunteer Rifle Corps, till 1899, the outbreak of the South African War, may be regarded as the First Volunteer Period. From 1901, the end of the South African War, till 1907, the days of the Haldane Reforms, may be called the Second Volunteer Period. From 1907 till 1914 was the time of the Territorial Force, from 1914 to 1920 the Period of the Great War, and finally, from 1920 to the present, the First Territorial Army Period. But though we may, for the sake of convenience, mark off these great periods, growth persisted all the time. The Second Volunteer Period, 1901–1907, was a time of constant discussion and debate; the pages of the JOURNAL for the years 1903, 1904 and 1905 are full of letters and arguments on the subject of compulsory national service, of the reform of the Volunteers and the like. The whole history of the Volunteer Force shows natural growth. A continuance of that growth we must be prepared for, even though it affect our status, our organization, even our nomenclature.

It may be thought that to claim for this year, 1935, an importance equal to the great years of 1907 or 1921 may be unjustified by facts. It is not suggested that the Army Estimates of 1935 are, in themselves, as revolutionary as the Haldane Scheme. Nevertheless, I believe that future historians of the Auxiliary Forces may well regard March, 1935, as a milestone in the history of the Territorial Army.

THE PRESENT POSITION.

There are many factors which emphasize the importance of this period. The first is a growing conception of realism in international affairs. I do not wish to be regarded as decrying, in the slightest degree, the extreme value of international co-operation and of every organization which makes for world peace. But in the international sphere there exists, on the one hand, the danger of militant nationalism, and, on the

other hand, there is arising a conception even among most ardent advocates of international concord, that stability in international relationships may have to be backed by the use of force. In other words, we have moved from the Albert Hall Disarmament meeting of 1933 to the National Declaration questionnaire with its paragraph 5b. One may equally well refer to the very important Joint Conference of the Trades Union Congress, the Executive of the Labour Party and the Executive of the Parliamentary Labour Party, held on 28th June last year.

The publication of the White Paper and the Defence Debate of Monday, 11th March, have obviously done much to emphasize the international aspect of our problems, so that there is no need to labour the point further at this juncture.

In the second case, and this is probably only subconsciously realized by the nation, we are drawing near to the end of the active life of that great reserve of man power trained in the years 1914–1918. It was recently pointed out by the chairman of one of the districts of the British Legion that the average age of members of that body was about forty-five. Every passing year reduces the possibility that we can again put into the field that demobilized host which in 1918 we, with justice, claimed to be the finest army in the world. The war in the future—if war comes—will have to be fought by men who have not smelt powder.

The third factor is the important development of anti-aircraft defence as a role for the Territorial Army. It is true that anti-aircraft units of the Territorial Army have been in existence for a dozen years or more. The 1935 estimates have, however, foreshadowed such a development of the importance of the Territorial Army in this role that we are now face to face with a military revolution of prime moment. It is surely no light responsibility thus undertaken. An Auxiliary Force, a volunteer organization, is put in the first line of national defence against one of the most dangerous forms of possible attack. The onus cannot be exaggerated. I am not sure that in the eyes of the nation as a whole these anti-aircraft units may not in the future appear to be of even greater importance than the older tradition-enriched units of the field army.

Fourth in place, though not fourth in importance as a factor of moment, I place the Territorial and Militia Act of 1921 and the overseas obligation embodied in T.A. Regulations, paras. 14–17. It may be argued that it is somewhat late in the day to quote as a present revolutionary factor an Act passed fourteen years ago. But I believe that it is only within the last few months that members of the Territorial Army

have begun to realize the full implication of the Territorial and Militia Act. Indeed, it is not so much the Act itself, but the contemporaneous introduction of the overseas clause in the attestation form which has made the great change. I must be allowed to repeat here what I have said elsewhere, that the effect of the 1921 Act and this overseas clause is so great that most of the pre-war argument and discussion about the Territorial Force has to go by the board. The Territorial Army to-day can be sent overseas by the passage of an Act of Parliament. It is part of our expeditionary force, and it stands immediately second to our Regular expeditionary force of five infantry divisions. Partly because we have, for some years past, lived in the mentality of the Great War we have, perhaps, paid scant attention to some possible results of this change of status. We have each, according to our own lights, either thought that further wars were very unlikely, or we have envisaged the large-scale complete mobilization of the 1914–1918 period.

I have mentioned four factors which I consider affect the present position of the Territorial Army :

(1) International developments.
(2) The ageing of our war-trained reserve manhood.
(3) The responsibility for A.A. defence.
(4) The overseas obligation of the Territorial Army.

These weighty impulses moving, so to speak, on convergent paths have this spring brought the whole influence of their impact to bear on our Territorial Army. Or, to change the metaphor, it is as if cloudy and distorted images, ill-focussed and ill-illuminated, have quite suddenly been brought into sharp relief, and we see in vivid and striking clarity our responsibilities towards the nation.

Figures are apt to be dull, and when delivered verbally not always clear, but I should like to refer you to the comparative figures for these dates.

On the eve of the South African War the British military forces at home consisted of :—

The Regular Army	131,000
The Army Reserve, Section A	5,000
The remainder of the Army Reserve	73,000
The Militia Reserve	30,000
The Militia effectives	65,000
The Yeomanry	10,000
The Volunteers	230,000
	544,000

a nominal strength of well over half a million men. But the Militia could not be sent overseas unless they volunteered, while the Yeomanry and the Volunteers could not, as such, go overseas at all. Moreover, the Militia was definitely regarded as a second-line force. If its battalions were sent overseas as units they were, speaking in general terms, employed only for garrison duty or duty on the line of communication.

The Haldane Reforms of 1907 introduced, as we know, great changes, and on the eve of the Great War the effective figures were :—

Regular Army at Home	125,000
Army Reserve	145,000
Special Reserve	64,000
Territorial Force	272,000
	606,000

The total number had risen, it will be seen, to 606,000 men, but still the only overseas fighting portion was the Regular Army. Thanks to the work of Lord Haldane, the expeditionary force had been considerably strengthened and its powers of mobilization quickened. The Militia had been converted into Special Reserve and become mainly draft-finding units. The Yeomanry and Territorial Force existed for Home Defence. But to complete the picture it is right to state that 1,062 officers and 17,621 men of the Territorial Force had accepted the obligation for overseas service and that three cavalry regiments, two Royal Engineer companies and six battalions of the Special Reserve did, in fact, serve overseas during the Great War.

Now let us consider the figures for the present day, taking for our purpose actual strengths rather than establishments, and dealing in round numbers :

Regular Army at home	104,000
Army Reserve, Section A	3,000
Remainder of Army Reserve	108,000
Supplementary Reserve	19,000
Territorial Army	133,000
	367,000

The total figure of 367,000 is, it will be seen, substantially lower than that of 1899 or 1914.

Before leaving these figures it might be well to give one more set of comparative strengths.

For 1899 will be taken the total of the

Regular Army at home	239,000
Army Reserve	
Militia Reserve	

for 1914 the

Regular Army at home	334,000
Army Reserve	
Special Reserve	

for 1935 the

Regular Army at home	234,000
Army Reserve	
Supplementary Reserve	

Naturally, the immediate comment that must be made is that the numbers are not the sole criterion of fighting value.

The Overseas Force.

But from the present viewpoint two other points need emphasis. The first is that the Territorial Army now becomes part of the overseas force. The second is that there is to-day no suggestion of " second-line formations." That is such an important innovation that it is worth while spending a few minutes in emphasizing the change in mentality. The Militia, Volunteers, and for that matter the Territorial Force, were envisaged as organizations producing formations of secondary fighting value. Such a conception is quite out of date. We look to the Territorial Army to produce, eventually, divisions and divisional troops fit to " lie in the line " alongside professional units of our Regular Army. Our calm assumption that this will be so is a tribute to the memories of our citizen army divisions on the Somme and in Flanders.

But it is a new idea in British military thought, and the readiness with which the idea is embraced to-day must not blind us to the desperately hard work that is required to translate idea into practice. Thus, while the problems and responsibilities of the British Empire have not diminished, the Regular Army as a whole, the Army Reserve, and the Supplementary Reserve—as, in some measure, the successor of the Special Reserve—are all smaller than in 1914. The sole new asset is the volunteer overseas force, the Territorial Army.

The Army Council may well have quoted Canning, and felt that they had called a New World into existence to redress the balance of the Old. The only difficulty is that there seems some slight doubt as to how we may best employ the benefits of this brave new world.

The Legal Status.

As to the legal status of the Territorial Army there should be no doubts, though I believe that, in fact, there exists considerable ignorance. The Territorial Army stands, in effect, second in our echelon of military preparedness at home. For the Army Reserve and the Supplementary Reserve will be heavily drawn on to bring up to war strength the formations of a Regular expeditionary force.

Now in the Army Reserve there is one category, section A, which can be called up without proclamation. It was, in fact, called up on the occasion of the creation of the Shanghai Defence Force. But it numbers to-day only 3,000 men, and obviously would only be sufficient for a minor expedition. Having regard to the present strength of the home battalions and the percentage of lads below age that are in these units, it is clear that for any moderate-sized expedition, perhaps even for a force the size of that employed by Sir Garnet Wolseley at Tel-el-Kebir in 1882, we should to-day have to call out by proclamation the Army Reserve. The results of this action are important, and in the following paragraphs I shall give the references either to the Army Act or T.A. Regulations.

As soon as the Army Reserve has been called out by Proclamation His Majesty can issue orders for the embodiment of all or part of the Territorial Army (Territorial and Reserve Forces Act of 1907, para. 17 (1), T.A. Regs., p. 315). It will be noted that the only portion of the Army Reserve which can be called out without Proclamation is Section A. The present strength of Section A is 3,000 men. The embodiment of the Territorial Army is, however, subject to the control of Parliament. (T. and R.F. Act, para. 17 (2).) But the Territorial Army may be called out even if Parliament is not sitting. Parliament must be summoned within ten days. It is to be noted, however, that it is extremely unlikely that a Government which had decided to go to war would not secure the approval of the House to the embodiment of the Territorial Army.

The following facts have to be borne in mind :—

(1) When the embodiment of the Territorial Army has been ordered every man must attend, or be a deserter. (T. and R.F. Act, para. 20 (1).)

(2) If the Army Reserve has been called out, although the Territorial Army has not been embodied, a man cannot claim his discharge before the expiration of his current term of service. (T. and R.F. Act, para. 9 (3).)

(3) He may be called upon to prolong his service for a period not exceeding twelve months. (T. and R.F. Act, para. 9 (5).)

(4) All the above refers to embodiment : but once embodied the Territorial Army can be sent overseas if an Act of Parliament authorizing the dispatch of the Territorial Army is passed. (T.A. Regs., paras. 14 and 15.)

(5) An officer is bound by his Commission unless and until his resignation is accepted. He has apparently no right to claim that it shall be accepted. (T.A. Regs., para. 143.)

It will be seen that the Territorial Army is affected not only by its own strength, but also by the strength of the Regular Army at home. For, if the numbers with the Colours are few and youthful, there is a greater likelihood that the Army Reserves might have to be called out for minor expeditions, and the mere fact of the calling out of the Reserves quite automatically alters the status of any Territorial.

FUTURE POSSIBILITIES.

Now in the light of these facts let us regard the possibilities. And, paradoxically perhaps, the first possibility that should be studied is that of a prolonged peace. After all, that is what we hope for, and therefore it is essential that this point should be made. We, in this country, regard peace as consonant with our highest interests. We are a vast trading community. We live by the freest interchange of traffic, both of goods, of money and of ideas. War, or the tension which is aroused by the threat of war, hampers such interchange, and these very checks upon freedom react adversely upon our nation. We covet no man's territory, we are proud to hold fast what our forefathers gave us. Therefore, not the least of the difficulties of the Territorial Association is that it may exist for years as a civilian force without having, in this country, the aid of that semi-hysterical stimulus of warlike incitement which we see applied in other places in the world to-day. It may not be easy for a civilian force to maintain its ardour and its mental self-control during a long period of external peace. There is a tendency for it to degenerate into pure showmanship or, at the worst, to become enmeshed in a political machine. The experience of some of the National Guard organizations in the United States during the period of peace which preceded the Spanish-American War show some of the difficulties in this direction.

It is worth remembering, moreover, that a prolonged period of peace would not entail for our Regular forces the same danger of fatty degeneration, for the very reason that some proportion, at least, of the battalions stationed overseas will carry out their training in conditions not far removed from those of active service. For years to come the

frontiers of India, and possibly stations in the Near East, may be relied upon to keep the standard of military efficiency of the Regular Army at a high level owing to the ever-present possibility of hostilities with a live and vigorous enemy. But for the Territorial Army the situation is very different. Ten years from now the generation of men who have seen active service will have almost completely passed away, even as commanding officers. It will require quite particular efforts to see that genuine soldiering is maintained at a high level. And that will have to be done very largely by the brigade and divisional commanders of Territorial Army formations.

A National War.

From such a picture of enduring peace let us go straight to the other extreme, to the prospect of a national war. In such an event the problem, though onerous, is comparatively simple. We may assume some form of government control of industry, national registration and national service would no doubt be introduced at an early date. And the expansion of the nation's military might will follow prearranged lines. We know now that the Territorial Army will form the framework for such an expansion, existing units will have to be brought to war strength, trained and dispatched overseas, while second-line units, and possibly even third-line units, will, in turn, be formed. There is little that need be said at this juncture in connection with such a contingency, save this one remark. Some of the machinery for mobilization must, of course, remain confidential, but I am not sure that we do not over-emphasize the secrecy of this operation, and I believe it would be all to the good if all Territorial officers were encouraged to think out the problems that will arise during that period. I believe, in fact, that, with advantage, divisional tactical exercises without troops or war games might perhaps, once in every four years, deal specifically with the embodiment and mobilization of the divisional units. As things stand at present, the embodiment and mobilization of the Territorial Army would undoubtedly find many senior officers but vaguely informed of what was likely to happen and what their duties would be.

Small Wars.

So far we have reviewed the two extremes. We have discussed Peace and Armageddon. Between the two there lies a vast field of possibilities. How the Territorial Army might be affected by small wars and minor expeditions is one of the greatest of the problems which we must face to-day. Our Regular Army is small in comparison with its liabilities, and the overseas obligation of the Territorial Army sets

a problem which has not heretofore been tested by the realities of actual facts. I have, in another place, mentioned various expeditions conducted by the British Army within the last century, and I may, perhaps, be permitted to refer once again to these, because I think that these events of the past do help us to consider what might take place in the future :—

British Forces in the Crimea, November 1855.	51,000 men (4,000 cavalry, 96 guns).
British Forces in Egypt, 1882 . .	7 cavalry regiments, 16 batteries, 25 battalions.
British Forces in South Africa, 1899–1902 .	448,435 all ranks (whereof 256,645 Regulars).
British Forces at Salonika, 1916 . .	6 divisions.
British Forces in Palestine, 1918 . .	3 cavalry divisions. 7 infantry divisions.
British Forces in Ireland, 1921 . .	51 battalions, etc.
British Forces at Constantinople and Chanak, 1922.	16 battalions, etc.
British Forces in Northern China, 1927 .	18 battalions.

It is only the very smallest of these expeditions which could be undertaken by the Regular Army without calling up the Reserves, that is to say, by the Regular Army stiffened only by the men of category A. For most of the events we have quoted it would be necessary, under present conditions, to issue a proclamation calling up Class I of the Reserve. Now, as we have already seen, whatever might be decided by the Government of the day, there remains the legal fact that once the Reserves have been called out it is permissible for the Government to embody the Territorial Army. And indeed a review of the circumstances makes it clear that, not only would this be permissible, but that it would, in fact, be incumbent upon the Government to take some such step, because we have only five formed Divisions in this country, and if, for example, three were sent abroad, there would be only two left. That may seem to be a childish piece of simple arithmetic, but it is essential to realize that two divisions is a very meagre imperial strategic reserve. Moreover, a strategic reserve may be all the more essential if tension has already occurred at one danger spot of the Empire. The depots and barracks of the divisions who have gone overseas will no doubt be full of recruits and drafts, training to go overseas to replace war wastage, but the only way in which we can provide in this country organized formations in reserve to take the place of those who are fighting, is by calling upon the Territorial Army. The problem itself presents nothing novel.

It was the weakness of the national organization in the Spring of 1900 which prompted Mr. Arnold Forster to say in the House of Commons, " We have got the whole organized Army out of the country, and the War Office is face to face with the problem of how to make an Army to take its place." Since those times of the South African War we have advanced: to-day we have an army to take the place of the Regular divisions. We have a new machine; it is called the Territorial Army and it has a present potential output of fourteen divisions. But we have created for ourselves another problem. The new difficulty is that this machine may not work very smoothly at half-speed or quarter-speed. Nor have we much experience to guide us if we try to make it function at double-speed. It is quite clear that to embody fourteen divisions when fourteen divisions are not required will be a very wasteful process, costly to the Army Vote, and damaging to industry.

I have suggested that if as few as three Regular divisions were sent out of this country a period of stress might set in. But that would hardly justify the embodiment of fourteen Territorial Army divisions. To develop this problem further we might consider the case of a war, in the Near or Far East, in support, perhaps, of one of our self-governing Dominions. The Committee of Imperial Defence might consider that in such a field of operation we could reasonably deploy and maintain a British expeditionary force of eight divisions. Such a force would impose upon the Territorial Army the duty of finding three or four divisions for the expeditionary force, and four or five divisions for Home Defence. And even so, the full number of fourteen has not been reached. Under those circumstances is the whole Territorial Army to be embodied and mobilized?

What the War Office can do, or rather what the nation can demand from the Territorial Army, is one thing. I have endeavoured in this connection to show that the liabilities undertaken by the Territorial Army are very far-reaching, and that quite early in the time-table of national military mobilization the Territorial Army comes into the picture, and can be called upon to undertake serious responsibilities. But what would at any given moment be wise or expedient is entirely another matter. We know that many Territorial units are made up of men important to industry, possibly even key men in their respective trades. It is obviously a matter for very careful consideration whether, for a small expedition, such men should be taken away. We know also that many officers of the Territorial Army are men whose livelihood depends on their own exertions. Embodiment for the purpose of Home Defence while part, perhaps the major part, of our Regular Army is abroad, might for these officers seem an onerous strain, out of proportion

to the benefit which the nation would have by their mobilization as a standing army at home. Moreover, major expeditions at a distance from the homeland might be long drawn-out. The old Volunteers and the Territorial Force thought in terms of the resistance to a foreign invader. Enemy forces landing in this country would obviously be defeated or be victorious in a very short while. The Volunteers who flocked to arms in defence of hearth and home might reasonably expect to be back at their peacetime job within a few months at the outside. The Territorial Army cannot in the same way regard with confidence its possible tour of duty.

I have put to you these problems because I believe that the eventual best solutions will have to be worked out by the Territorial Army itself in conjunction with the War Office, and I have, of set purpose, put the two partners in the collaboration in that order. It is quite clear that the War Office has power to say that such and such a programme of embodiment or mobilization should be carried through. But I believe that it is incumbent upon us to recommend to the War Office those steps which we, with our local knowledge, believe could be carried out with the greatest efficiency and the least friction upon local employment or local conditions. For, above all things, we have always to think of the maintenance over a period of years of some form of auxiliary force.

We can readily envisage a sorely tried War Office, faced with the demands of an exacting and perhaps not too popular overseas campaign, using the powers conferred upon it by the Territorial and Militia Act, embodying and mobilizing the Territorial Army and sending it overseas. It is not then that the difficulty will arise; the strain would be felt three or four years afterwards, when recruiting for this voluntary force might sink to nothing. Therefore, as I have said, in legislating for the possible uses to which we shall put our Territorial Army organization, we must remember the words of Solon, who said, "I give the people not the best laws, but the best laws that they are able to bear." In other words, we have to consider not the ideally best method of deploying our national strength, but the method which is most likely to commend itself to those men who, by their voluntary enlistment, to-day make up the Territorial Army. And, perhaps, that is no such bad limitation, because it does mean that our Government are not likely to engage the nation wantonly in a war, but that, before the guns go off, they will make sure that they have the people whole-heartedly behind them. On the other hand, it is the duty of the Territorial Army to make perfectly clear to the nation as a whole what its responsibilities are likely to be in the case of war. *The Times*, and we all have to thank that great journal for the interest it takes in the Territorial Army, has said that,

though I have pointed out the difficulties, I have no solution to offer. This is perfectly fair comment. I believe that the solution will have to be found to a great extent along the basis of frank improvisation. I believe that we will have to face every problem demanding a military answer in accordance with the needs and possibilities of the moment. This is neither so difficult nor so unlikely as might appear.

Continental Systems.

A very pertinent example has recently taken place, and it is of special interest because it gives an answer to those people who believe that conscription would provide a ready-made solution to all our military difficulties. The fact is that conscription provides an answer to only one military problem, and it is just the problem which we, in this country, have not got. Conscription provides a vast host to man a frontier, or to invade a neighbour. It does not provide an expeditionary force. The examples of France and of Italy are sufficiently apt to prove this thesis.

Italy has, within the last few days, dispatched an expedition to Abyssinia. She has, as we know, a force of some 32 divisions in her active army, and an annual class of some 200,000 men. It would, of course, be possible to employ her large conscript army and to call up her vast masses of trained reservists. Yet Italy has found what every conscript nation must find in the end, that great jealousies are aroused, both industrial and local, unless conscription is applied as an equal burden over the whole country. It is not, in fact, practicable politics if one division is required to mobilize only, shall we say, the division of Florence and send that overseas. In face of these difficulties Italy has, to a certain degree, improvised. She is utilizing for her expedition a large number of unemployed men. Some of them are volunteers who have formed three improvised Black Shirt battalions to act as corps troops. The remainder are reservists. Nominally the 1911 class has been called up to provide the latter, but actually the class is so large that, as a rule, only reservists of that class that are unemployed have been taken. Two regular divisions thus brought up to strength have sailed, but two reserve divisions of the same districts have been formed to take their place in the home army. The force abroad, therefore, becomes supernumerary to the Home Army, and the material sent abroad is also struck off and replaced at once from industries.

The case of France is also of great interest to us. France has brought her system of mobilization, and the working of her system of military service, to a very high plane of efficiency, but France has also experienced

the difficulty of using conscript forces in overseas expeditions. Normally speaking, Frenchmen serving with the colours in France as conscripts will not nowadays be sent overseas unless an extraordinary emergency has arisen which has necessitated mobilization. Since the end of the Great War, her operations against Abd-el-Krim in Morocco and in the Jebel Druse (Syria) has found France with no adequate means of dealing with a small overseas war. It is for that reason that France has created the " Forces Mobiles," equivalent in strength to about five divisions and chiefly composed of coloured races.

THE PROBLEMS OF EXPANSION.

It will be seen, therefore, that all nations possessing overseas empires experience in greater or lesser degree the problem of expanding their military strength to cope with a medium-size overseas war, not large enough to become an affair of national emergency nor justifying the calling out of the manhood of the whole nation.

I have said before that I believe a solution may be found in a capacity of *ad hoc* improvisation. This, I realize, is anathema to a certain type of General Staff mind, which likes cut and dried schemes for mobilization. Unfortunately, our problems are certainly not likely to be cut and dried ; in fact, the possible permutations of our strategic problem will reach astronomical figures.

Of course, it is a very great advantage to have a good deal of the groundwork of an expansion plan worked out beforehand. But sometimes the very existence of preconcerted arrangements may be misleading. Sir Frederick Maurice quotes a valuable example. On the occasion of the War Council of 5th August, 1914, Lord Roberts and others wished to concentrate the British Expeditionary Force in Belgium. Lord Kitchener thought that Maubeuge was too far forward. Such suggestions were, however, countered by Sir Henry Wilson's protest that the French railway timetable had already been worked out for our concentration South-East of Maubeuge. The advisability of such an area for the assembling of the British Expeditionary Force is not now under discussion ; the point is that the argument used was fallacious. As Sir Frederick says, the French 4ème Bureau could quite easily have provided in one day, let alone in the eight days available, trains and timetables to move four divisions and one cavalry division from any French port to any area in France.

It might create a better impression if, instead of speaking about improvisation, I said " freedom of manœuvre," or " flexibility of organization."

Let us see what expedients are available. First, to deal with the small overseas expedition which calls two, or perhaps three, Regular divisions out of this country. I suggest that help might be found in paragraph 15 (2) b of the Territorial and Reserve Forces Act, as qualified by paragraph 16. This portion of the Act allows His Majesty in Council to order the training of the Territorial Army to be extended for a total period of not more than thirty days in each year. Paragraph 16 provides that, before any such order is made, the draft must be laid before each House of Parliament. It might be worth while using this method of securing some reserve of power. The fourteen divisions might be called up for a month's training at a time, at their ordinary peace strength, without the full majesty of embodiment. It is, in short, the method used during the South African War, when, for the first time, the Volunteers went into summer camp as units. The other method, which might with advantage be studied, is the procedure adopted in the case of the City Imperial Volunteers, which corps was formed by selected men from all the Volunteer units of London.

Service battalions and other units formed on such lines may prove the best means of securing for the Regular Army a reinforcement of three or four divisions. In the case of the City Imperial Volunteers none but serving volunteers were accepted. In the service units now suggested direct recruitment could also be allowed. The process is not quite the same as the expedient known as "skimming," which has sometimes been discussed and is not generally popular. By "skimming" I would understand the compulsory removal of selected units from a division and the breaking up and reassembly of division organization. That seems undesirable. But the throwing off by a division of a wartime service unit to represent that division overseas on an occasion which does not demand the dispatch of a large Territorial Army contingent would be, in my view, an expedient well worth studying.

So far, I have stated problems and suggested possible methods of improvisation or development on the outbreak of war. Very much can, however, be done in the years to come to prepare ourselves for these problems, and I am going to venture to suggest possible courses of action for the Territorial Army.

Air Defence.

In the forefront I shall place the question of Air Defence. It is, perhaps, no exaggeration to say that the recently imposed responsibility for the Air Defence of Great Britain is the most vital of all the tasks at present borne by the Territorial Army. If the citadel of the Empire be vulnerable it is idle to think of an expeditionary force. The supreme

necessity for providing an adequate Air Defence for London and our industrial areas has demanded the conversion of several infantry battalions to Air Defence units. We all appreciate the reluctance which units feel when they are asked to break with the traditions of their past. I believe it is possible for all of us to contribute to the success of these conversion schemes. It is essential that the Air Defence formations must consist of highly efficient units. Their prestige must be established in the eyes of the public and of the Territorial Army itself. While due regard must be paid to the military necessities of secrecy and to the military tradition of a certain professional obscurantism, it must be remembered that voluntary service does demand a certain amount of publicity. When the Air Defence formations have to compete with a powerful press and with speeches in the House of Commons, deriding their value and denying their ability to defend London, it is essential, if recruits are to be obtained, that the new formations should be able to stand up for themselves and to counter-attack in the face of criticism.

The Field Army.

For the remainder of the field army the prime requisite is now, as ever, the maintenance of prestige. That word includes every course of action which will maintain the high standard of military tradition which will make for contented men in the ranks and for a hard-working and intelligent corps of officers. Numbers in the field army are of secondary importance, quality is everything. The higher training of officers is one of the subjects to which reference has already been made. It is suggested that further developments along these lines should be studied. A very slight expenditure of money will have excellent results. There is at the London University an excellent course for Territorial officers in staff duties. It lasts for two years on two evenings a week, but the fee is relatively high, £25 per annum. I believe it is not unfair to suggest that an officer who takes the trouble to go through this course is worth as much to the country as a motor driver of the Supplementary Reserve. I see no reason why a portion of these fees, at least, should not be met by the Government, or even why the commanders of the London Territorial divisions should not be allowed to nominate officers to this course and to arrange for the complete fees to be paid from their training grants.

I believe that very great value can be obtained from attendance at army manœuvres, and that in September, on Salisbury Plain, there might be arrangements for Territorial senior officers to attend a three or four days' peripatetic school under the guidance of some Regular senior officer.

CONCLUSION.

Above all, I would urge that the Territorial Army should be encouraged to think out its own problems. The objection is sometimes raised that it is impossible to get Territorial Commanding Officers to agree on any given subject. There may be an element of truth in this comment, although I believe that on certain major issues they are surprisingly unanimous. Such divergences of opinion as are experienced largely arise from the very fact that the Territorial Army has little opportunity to think on a large scale. The psychological effect of being called into the councils of the War Office is very great, and it is only fair that the Territorial Army should be consulted and should be given the power and responsibility which arises from joint consultation. After all, " no taxation without representation " is an old battle-cry in the English-speaking world. We of the Territorial Army tax ourselves pretty deeply in money and in service and put our lives in jeopardy for very small reward. Is it such a terrible thing that we should ask to have some slight say in the ordering of our destinies ?

Years ago, in the " bad days," such a request might possibly have been regarded by the Regular Army as in some manner an affront to their judgment. I am confident that such a viewpoint no longer holds. It is, I feel, appreciated now by the Regular Army that the Territorial Army is a very valuable ally against unfavourable elements in the general public.

We have the promise that, in some form, a Territorial Army Advisory Council will be instituted. I should like to urge the following considerations :—

(1) The Members of the Council should be given status.
(2) They should not be too old.
(3) The Council should be constantly in being, which does not, of course, mean that it should necessarily meet daily or even weekly. Its Members should, however, always be individually on duty.
(4) That, as far as possible, the Council should direct its attention to certain definite problems.

It is not easy for a Territorial officer to get a viewpoint of the whole Territorial Army. Our Director-General knows far more about the Territorial Army than any of us do, yet as I wrote that line I thought of a not inapt simile. We happily married men may pride ourselves that we understand what our wives are thinking about. In fact, that is a fond delusion. At best we have a masculine conception of what is passing in a feminine mind. The delicate nuances we miss altogether. Much in the same way I believe that no Regular officer, however hard

he tries, can ever put himself exactly in the position of one who has worked for years through all the grades of the Territorial Army. I believe that if one or two Territorial Army officers were put in a position where they had full opportunities of gaining knowledge of the entire Territorial Army organization, then that knowledge, interpreted by them in the light of their own experience, would be most valuable to the War Office.

In particular, I would urge that the War Office and the Territorial Army take great heed to the question of the post-embodiment employment of the men of the Territorial Army. I believe that I may claim to have done some slight service on behalf of the recruiting of the Territorial Army, but I confess that when I consider the great personal hazard which is run by a young married recruit—hazard to his livelihood and to the well-being of his family—and when I consider the pitiful reward which he receives and the lack of any guarantee that his services will be properly met, I frequently doubt whether my recruiting zeal can justify itself. The great recruiting agents of the Territorial Army are, after all, the unit and sub-unit commanders. They must bear a great responsibility towards these men whom they induce to enlist in our ranks. I believe that within the next two or three years we must solve this problem if we are to be fair to our men and to our own consciences.

We have grave problems to solve. They will demand long views, sacrifice of treasured dogmas, and a great deal of hard work. I believe that we of the Territorial Army have a right to ask that we be taken seriously and be listened to. But that claim will only be justified if we, in turn, guarantee to the country the efficiency of our force. I do not despair of the issue; I believe that we can face our difficulties and maintain the efficiency of this Force, whereof we are so justly proud.

DISCUSSION

Lieutenant-Colonel G. C. Wickins stated that he had recently heard Lord Hailsham say that if the Territorial Army were abolished the country might be faced with short-term conscription for a larger Regular Army. Could the Lecturer give any indication of what the difference in cost would be?

Captain E. Altham, R.N., thought that the Lecturer had not said anything about the future responsibility of the Territorial Army for coast defence. As this subject affected the Royal Navy, he invited the Lecturer to remark on it.

Major Carlton-Hall, in reference to coast defence and anti-aircraft defence, remarked that those who went through the mobilization of 1914 would agree that any Territorial unit that could assemble 90 per cent. of its strength at a given place twenty-four hours after the declaration of war would do a very smart piece of work. Was any arrangement in contemplation whereby Regular troops could undertake

the duty of coast defence and anti-aircraft defence before the Territorial Army was ready to take over such tasks ?

MAJOR R. L. WHITMORE, R.A., asked whether it would be possible to establish a Directorate for recruiting for the Territorial Army. He was of opinion that the present system, as far as Unit Commanders were concerned, was very haphazard and amateurish. A suitable Directorate seemed to him to be desirable.

MAJOR G. L. L. WHITE, R.E. (T.) asked whether the formation of a Territorial Army Reserve had been considered, with a view to keeping in touch with men who have served and have left the Territorial Army.

LIEUTENANT-COLONEL W. A. LETHEM, R.A.M.C., enquired whether it had been considered that coast defence and anti-aircraft services should be recruited from men who either from age or from physical disability were unfit for service overseas in an expeditionary force.

SECOND-LIEUTENANT L. JONES (6th London Regiment) asked whether, in view of the remarks made with regard to conscription for the Regular Army, the Lecturer would state his opinion as to the possibility of conscription for the Territorial Army, say, for four years or some other period.

SECOND-LIEUTENANT F. N. GREAVES (R.C. Signals) had heard it suggested that a payment of 5s. per week to every man in the Territorial Army would cost less than £2,000,000 a year. He desired to know whether the Lecturer thought that this would act as a definite aid to recruiting and would give the War Office greater control over the Territorial Army for training purposes.

THE LECTURER :

I think that the Territorial Army has accepted responsibility both for anti-aircraft and for coast defence, and must be ready to man its guns and its search-lights at the word " Go." That does mean, of course, that it is essential that the Territorial Army in peace time should be very near its war establishment. That is one of the reasons why I emphasized the importance of air defence formations and why they deserve all the support that we can give them.

With regard to the suggestion that older men, who have previously served in field Army formations, might be employed for coast defence and anti-aircraft services, it appears to me that the answer to that is largely contained in General Ashmore's and Colonel Rawlinson's books on the subject of the air defence of London. Both writers seem to imply that young men and very fit men are required for anti-aircraft work, especially for long hours of work at night. After all, a considerable amount of physical energy is required to load an anti-aircraft gun and to put a 100-lb. shell into a 6-inch gun, and I do not know that it would be very satisfactory to employ men who are much past the full vigour of military age.

The question of recruiting for the Territorial Army through a combined Directorate of Recruiting goes a little beyond what is required, I think. Recruiting, after all, must be a unit affair. The best recruiting agent is the contented man in a unit, and unit commanders do know their own problems. I feel very strongly, however, that there should be a clearing house for information and a central clearing house for propaganda. How that is to be achieved I really cannot say at the moment.

A Territorial Army Reserve would, no doubt, be a valuable thing, and I am sure the Territorial Army will deal with the question.

With regard to the payment of 5s. a week to members of the Territorial Army, and also the question of conscription for the Territorial Army, to-day we have, under the most appallingly bad conditions, 133,000 Territorials. I often think that that is an amazing figure. We do not want very many more. If we could get just a little—nothing like 5s. a week—it might give us the slight rise in numbers and the steady rise in numbers that we want. I think the expenditure of an extra £2,000,000 per annum or the introduction of something so alien to our Constitution as conscription would be going too far for the problem that we have to face.

THE CHAIRMAN:

Some of the questions which have been asked touch upon problems which are being very closely studied at the present moment. Probably everyone realizes that what I may call the very active interest of the Government in the Territorial Army began a comparatively short time ago. This very active interest in the problems of the Territorial Army means that a certain amount of money is forthcoming. Readers of the Army Estimates speech know that the sum of money that is being spent on the Territorial Army this year shows an increase of something like £600,000. It cannot be more, for various reasons. Directly money begins to be spent and preparations are made to put the machine into really good order all sorts of problems arise, and a good many of them have been touched on this evening; for instance, the problem of the Territorial Army Reserve and the problem of ensuring that the coast defences and the air defences are in such a state of preparation that they can undertake their duties not only on a declaration of war but, if necessary, a good many hours before. Those are the sort of problems that do arise; they have to be studied and are being studied to-day.

In conclusion, I will say that Colonel Dunlop has put the problems before us very clearly—so clearly that they do not appear to me any easier than they did before! Some of the solutions which Colonel Dunlop has put forward, however, will be of very great assistance.

When I asked Colonel Dunlop if he would be willing to give this Lecture I told him nothing of the plans that were being formulated in the War Office; and only an hour before the Estimates speech was made was he told what was going to be said. That is all the inside information that Colonel Dunlop has had. We made this arrangement because I desired to hear the Territorial view of the Territorial Army problems, and not the views of a Territorial Army officer who might possibly have been previously influenced by the Director-General!

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

SOME ASPECTS OF AIR OPERATIONS AT SEA

By COMMANDER R. M. ELLIS, R.N.

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REAR-ADMIRAL C. E. KENNEDY-PURVIS, C.B., in the Chair.

THE CHAIRMAN: Commander Ellis has been an Observer since 1924 and has also had staff operation appointments at sea, which have given him the general point of view, so I think he knows a great deal about the subject of his Lecture.

LECTURE.

AIR operations at sea, as we now know them, are the product almost entirely of post-War appreciations and peacetime experience. Their tactics and technique have therefore for the most part not yet been subjected to the test of war. This makes it all the more important that, in formulating requirements and anticipating results, a liberal allowance should be made for the effects of opposition, the "fog of battle," the removal of peacetime safety aids and limitations, and the other factors which are generally lumped together under the name of "war conditions."

Unfortunately it is evident from the false claims and arguments of some protagonists of the air weapon that they are blind to this necessity; moreover they fail to see the road which they must travel if they are to circumvent the obstacles to which those "war conditions" will undoubtedly give rise. However uncongenial it may be to have to assess the effects of war conditions upon naval air work, unless some such assessment has been attempted and taken into generous account, no statements upon the potentialities and use of aircraft over the sea can be relied on.

SHORE-BASED AND SHIP-BORNE AIRCRAFT.

Before going further, let us also note that it is necessary to draw some distinctions between operations over the sea by shore-based aircraft and those carried out by aircraft borne in ships, because, although admittedly obvious, they are in actual fact not infrequently forgotten in the heat of "ship *versus* aircraft" arguments. These distinctions may arise occasionally through differences in the operational

objects, often from differences in the types and characteristics of the aircraft it is possible to employ, and always from the many differences there are between ships and shore bases in regard to their facilities and limitations for operating aircraft over the sea. This does not mean that there can be nothing in common between operations at sea by shore-based aircraft and those by ship-borne aircraft; far from it. But one can see, if one looks into the sources of difference just mentioned, that the influence of air forces upon a given naval operation may vary very greatly, in nature or degree or both, according to whether they are shore-based or ship-borne, and if shore-based, further, according to whether they are or are not fully trained in naval air work of the kind they are undertaking.

There are many naval operations upon which shore-based aircraft could exert no influence at all, simply through being unable to reach the scene. Then there are others where inexperienced non-naval air units may easily deceive themselves or be deceived, and send erroneous reports, lose touch, or fail altogether to make contact, attack the wrong objective, or put themselves into a position to be destroyed, as has so often happened even in the simplest exercises. Most non-naval air units, moreover, lack the specialised equipment necessary for naval air work. In contradistinction, ship-borne fleet aircraft can be brought to any scene of action, reliance can be placed upon their knowing what to do, and they have the necessary training and equipment to enable them to do it.

At the same time, from a shore base, it is possible to employ aircraft of larger warload or superior performance than those of aircraft which can be ship-borne. And it is futile to deny that, if the airmen know their job, areas close to large concentrations of such aircraft could be made untenable for all but the most heavily protected or most mobile and evasive ships. Similarly, more aircraft can often be concentrated on land near a threatened point than the opponent can bring with him by sea, a factor likely to be of importance in considering protracted naval operations close inshore.

I mention these instances because a proper perspective is much wanted at the moment. A considerable section of the Press is engaged in trying to convince the public that the days of fleets are over, and has no scruples whatever in misrepresenting the conditions and events of combined exercises to prove that the shore-based aircraft has driven the warship from the seas. At the same time, somewhat paradoxically, the air propagandists have rarely a good word to say for the ship-borne fleet aircraft; often, in fact, the reverse. On the naval officer such Press commentaries are apt to have the opposite effect to that which they

are intended to have upon the layman, since their many obvious absurdities make him contemptuous of the whole argument and inclined to believe that coastal defence aircraft will never constitute a threat to warships at all. The truth, of course, lies somewhere in between, exactly where depending on the circumstances and character of the particular operations and on the nature *and previous training* of the air forces engaged ; all of which *must* be remembered when estimating what aircraft will or will not be able to accomplish in any given naval operation.

THE IMPORTANCE OF NUMBERS

Now let us turn to another most significant general factor in naval air work, namely that of numbers. In air attack and defence at sea the effect of numbers increases more than proportionately with an increase in the numbers themselves assuming, of course, that all the air units are properly trained and equipped for their work. For example : say three torpedo-bomber squadrons simultaneously attack a group of ships whose combined instantaneous capacity for A.A. defence just enables the group to engage that particular number of aircraft effectively at one time ; then there will be every chance of the attackers being so put off their stroke that they will fail to score any hits at all. But if a fourth squadron joins in the same attack, then that squadron would virtually have a free run in, and should almost certainly get its attack home. In this case a 33 per cent. increase in the number of aircraft may increase the number of hits from *nil* to half-a-dozen. Conversely, had only one squadron attacked instead of three, not only would it have failed to achieve results but it would have suffered heavy casualities. Attacking at first in " penny numbers " is, in fact, the surest way of being rendered unable to carry out an attack in force subsequently.

Another point : if the total number of aircraft available at hand can be increased until it becomes possible to launch large scale attacks in such rapid succession that the enemy's fire, flooding, and repair parties can no longer keep pace with the damage inflicted; then the effects of that damage will become cumulative and the ships sustaining it may be overwhelmed. On the other hand, if attacks can only be made at intervals of hours, the ships will have time to effect repairs or take counter-flooding action in the intervening periods and may be " almost as good as new " by the time the next attack arrives.

In air reconnaissance at sea the need for numbers is not at first sight so apparent. In fact, for a single, more or less restricted, search or screen, such as that usually called for in a peacetime exercise, comparatively few aircraft are required, and the size of the area that can

be covered by a single search varies directly with the number of aircraft available for it–that is to say within and up to the maximum area that a single search can cover. For prolonged reconnaissance, however, such as we must expect to have to carry on in wartime, the effort necessary can mount up to a surprisingly large total, as the following examples show :–

	Task.	*Effort Required* (on search only).
i.	A. To search from a certain starting point for an enemy who may be in a certain area (about 180 by 130 sq. miles) at the start of the search, moving between certain limiting courses and speeds.	60 aircraft hours.
	B. To search from the same starting point for an enemy who may be in an area *double* the size of the above at the start of search (through having twice the angular width of limiting courses).	265 aircraft-hours, (i.e., approx. 4½ times the above).
ii.	A. To maintain search over a certain relative arc round a fleet, so conducted as to ensure sighting at a certain distance, for a day of seven hours.	170 aircraft-hours.
	B. To maintain the same search for a day *double* the length of the above.	405 aircraft-hours, (i.e., approx. 2.4 times the above).

NOTE.—The exact details of the " tasks " in these examples have been withheld.

It will be seen how the flying effort required, expressed as " number of aircraft-hours flown (on search only)," increases in more than direct proportion to the increase in the task to be undertaken, in each of the above two pairs of examples, which represent two different types of reconnaissance task. The explanation of this, without going into detail, is the disproportionate increase in the effect of certain effort-absorbing and wasteful factors when the initial task is increased in the manner shown.

These examples are not exaggerated cases. They represent the meeting of quite reasonable wartime situations, with average values

for speeds, initial positions, and the other factors involved. The figures given for the " effort " are correct, of course, only for the specific values assumed for those factors ; moreover, they do not include the necessary allowance for such contingencies as having to change the area of search unexpectedly, visibility falling below that taken as normal in calculating requirements of numbers, aircraft failing to return through faulty navigation or mishap, or aircraft becoming unserviceable on board through prolonged wear and tear or bad weather. To meet such inevitable wartime contingencies the total number of aircraft required at the outset will be still greater, probably by some thirty or so per cent., if the work that can be undertaken is not to fall off too rapidly with time.

If this assessment of the consequence of numbers is correct, it is not a little disturbing to contrast our present strength in aircraft capable of operating with the fleet with those of some of the major foreign naval Powers. The following table compares in ratio form the fleet and coastal air forces of the British Empire with those of the countries shown, taking ours as unity :–

	British Empire.	*Japan.*	*United States.*	*France.*	*Italy.*
Operational :—					
Fleet-borne . .	1	1.3	2	0.3	Small
*Shore-based . .	1	2.9	2.75	2.25	3.5
Total Operational Units	1	1.8	2.3	0.9	1.1
Training and other non-operational (mostly service types)	1	About 2.8	4.5	About 1	?
Grand Total, all types .	1	2	2.9	About 1	About 1

One cannot help being struck by the disparity some of these figures show ; a disparity which would become much more marked locally in any naval operations overseas.

* By " shore-based " is meant naval or coastal defence aircraft based ashore or on tenders, and does not include military or other air units not trained in naval air work.

AIR SUPERIORITY.

Then there is the question of gaining air superiority in a naval operation; the connotations of this differ in point of detail from those of gaining air superiority in a land campaign, though the broad issues are similar.

Apart from the initial necessity of having an air arm generally commensurate with that of the enemy, at some stage of any given naval operation it will be necessary to take definite tactical action to establish a marked ascendancy in the operational area over the opposing air arm, if present; firstly in order to deprive the enemy of the use of his aircraft or to counter their activities, and secondly to secure to us the continued use of our own air arm. If this ascendancy is not established, then at best the air situation will become one of stalemate, the results of the opposing air efforts cancelling each other out. At the worst, if the enemy gains air superiority, we may find ourselves rather in the position of a blind man with a bludgeon attacking an opponent who not only has a bludgeon but full possession of his faculties and a number of effective missiles.

The quicker we are off the mark in the tactical contest for air superiority, the greater, by far, is our chance of success, because air units at sea are cut off from replacement sources, so that what is once lost must subsequently be done without, and their principal floating bases are few and vulnerable. Conversely, there is a strong tendency for an advantage, once gained, to become cumulative. The same factors also make the penalty for failure final, so far as that particular occasion is concerned.

In seeking local air superiority, the first step is early and vigorous air search for the ships carrying the enemy air arm, against which it is subsequently intended to act.

While cruising, it is possible to organize a fighter defence force which, combined with the rest of the fleet air defence system, will effectually oppose any scale of attack normally likely to develop during that phase. But that, of course, is not establishing superiority over the enemy air arm in the operational area as a whole.

The enemy having been found, however, it is not practicable throughout the succeeding phases of an operation to maintain enough fighters in the air to make sure that by their efforts alone the requisite degree of mastery over an opposing air arm of equivalent total size will be gained and kept. Fighters are essential; but aerial fighting to the extent that it can be employed and relied upon in naval operations is not, by itself, enough to ensure air superiority. Another measure must, therefore, be

considered, namely that of destroying the enemy's power to launch and operate his aircraft.

For years to come it is likely that, for technical reasons, the greater proportion of any sizeable air arm employed at sea out of operating range of shore bases will be carried in aircraft carriers, while all ship-planes in a fleet will remain dependant on the carriers for refuelling and rearming after their first flight. It will follow, therefore, that if RED, say, can put BLUE'S carriers out of action, then BLUE will be deprived of the further use of the greater part of his available air arm, including most of the only aircraft capable of seriously injuring RED'S heavy ships.

Now aircraft carriers as a class are, naturally, favourable targets for air attack, and in most operations the earliest and most rapid means of getting at them will be by air. Since any air striking force that BLUE contrives to launch before his carriers are put down may get in an attack on the RED carriers, it behoves RED to strike by air at the BLUE carriers—and to strike hard enough to put them effectually out of action—before they can fly their aircraft off at all. Otherwise the position of aerial stalemate may arise, each side having " downed " the other's carriers at the same time, whereby both lose their power to strike by air again. Alternatively, if RED directs his initial air effort against some other objective and meanwhile his carriers are sunk, his air striking forces will be unable to attack again, while BLUE'S can continue to develop their full output and next turn their attention to their opponent's heavy ships.

This consideration is, I suggest, especially important in relation to the use of the air weapon for tactically " fixing " the enemy. The enemy must be prevented from delivering attack for attack if he is to be " fixed " at all, or at least if he is to be " fixed " for more than the brief interval between our first attack on his main body and his attack on ours. Still more must he be prevented from securing such initial air superiority as will ultimately enable him to deliver a greater number of attacks than we can.

The same consideration is important when the initial tactical aim of one side is to reduce the capital ship preponderance of the other by air attack before accepting battle. It will need more than one air attack to sink or incapacitate heavily protected ships, and it may therefore be argued that the first duty of the air arm of a superior fleet is to destroy the power of the enemy air arm to attack again—the object of this being to preserve what preponderance of surface force or speed its own side already has, and to ensure that that much at least is secured before trying to increase the margin.

It must be added that it will still remain for fighters to deal with the considerable number of aircraft carried by and launched from the enemy heavy ships and cruisers. Among these latter will probably be the enemy spotting aircraft, whose early extermination is greatly to be desired.

Before leaving this subject, the problem of gaining air superiority may be instanced as one of those which become very different if and when the operational area is within close range of large shore-based air forces. So much so, I suggest, that operations by fleet aircraft against large scale shore-based air opposition should only be undertaken when they are necessary for the attainment of a major *naval* object or the *naval* object in a combined operation. Nothing else would justify the losses in fleet aircraft and damage to the carriers which would have to be expected. At the same time it must be added that the offensive powers of such opposition will fall off rapidly with distance to seaward, and there are many regions within nominal range of shore-based air forces which they could not effectively control.

AIRCRAFT SPOTTING

In the present day, to embark on a crusade in favour of aircraft spotting would be behind the times, since in the last few years it has made great strides, not only in technique but in capturing the general imagination. Its value in principle is acknowledged. It does, however, still remain to assess the relative influence it is capable of exercising in different circumstances, and from that to establish its proper place in battle tactics.

Its utility in coastal bombardments was demonstrated in the late war, and since then technical improvements have widened its application to that class of operation. For actions at sea, aircraft afford the only effective means of observing fire on a target within gun-range but out of sight owing to distance, haze, or smoke. This is not a plea for extreme range gunfire: it applies, rather, to those frequent occasions when, although the target is within quite effective gun-range, the visibility is such that observation of fire from ship level is impossible. The only immediate answer to an enemy fleet equipped and trained to fire in such circumstances is for our fleet to be better equipped and trained in the same respects. A fleet that is able to employ efficient control of fire under any conditions must obviously be at a tactical advantage to one that is not.

There are occasions when the enemy is just sufficiently visible for our guns to be laid, but when the fall of shot cannot be made out from the ship. Under such conditions there may be a great opportunity for

deliberately exploiting aircraft observation in order to develop superior gunfire, if it is possible to manœuvre our fleet into a position where it will secure natural advantage in visibility, or if we are able (without blotting out the enemy's ships from ours) to obscure his vision by artificial means.

Then there is the " end-on " target, offering such a narrow object that salvoes frequently cannot be observed for range from ship level owing to their being slightly out for line. With aircraft reports, range corrections can be made on such salvoes, thereby establishing hitting more quickly and saving ammunition. Both these considerations are of particular importance in cruiser encounters, and it is in cruiser encounters that end-on targets are so frequently presented.

Finally, even in the straightforward parallel action in clear weather the ability of spotting aircraft to clear up points doubtful to control officers, and to provide certain useful information not obtainable from other sources, may just make the difference between two otherwise equal fleets. So that even here it is worth an effort to ensure aircraft spotting being available.

THE DEFENCE OF TRADE

Of the remaining aspects of air operations at sea, perhaps the one with the best claim to our attention is the defence of trade against air attack. The use by a belligerent of aircraft actually to attack merchant ships at sea, as opposed merely to reconnoitring on behalf of other forces, must mean that he has elected to risk antagonizing neutrals and inviting retaliation, in resorting to this exhibition of " frightfulness." Although no international agreement has yet been come to prohibiting this use of aircraft, such a form of warfare could not be indulged in without violating the spirit of the rules commonly held to govern the conduct of all forces attacking trade at sea ; indeed, it would mean that even the most elementary humanities had been discarded.

One might like to think that no civilized Power will ever resort to such a course. But our experiences in 1914–18, and the docility with which in more recent years world opinion seems to have resigned itself to the prospect of barbaric methods in aerial war, constitute a warning which we cannot disregard. We must be ready for an enemy to use his aircraft in direct attacks on shipping ; if, when the time comes, he conforms to civilized conventions, and only uses them for reconnaissance, so much the better.

On ocean routes, far from land, attacking aircraft must, so far as it

is possible to foresee at present, operate from seagoing raiders. Their effect, under such conditions, is primarily to increase the striking range and vision of the surface vessel carrying them. While this makes the surface raider more dangerous than she was before, the defence problem remains mainly one of defeating that same surface raider. For this purpose the protective forces will, of course, need aircraft to put them on equal terms with the raiders as regards radius of vision and, sometimes, striking range. But our general dispositions and methods of shepherding the traffic on the ocean routes will be able and, I think, will have to follow the same principles as in the past.

At terminal ports, the protection of the shipping in them is part of the problem of defending the ports themselves. A threat to its terminal ports is plainly the most serious danger of all those which seaborne trade can have to fear from aircraft ; and in the event of war with a strong air Power within easy range of our territory the air defence of our principal ports is likely to become a major responsibility. That responsibility must rest with the Royal Air Force, and is one for which the fullest provision is obviously vital. Incidentally, the threat to ports may exist even when the enemy is observing the rules of war against merchant ships at sea.

Lastly, we have to consider attacks by aircraft in focal areas where shipping routes normally converge or pass close to land. Such attacks might be made by ship-borne aircraft, although this is improbable in waters which are near concentrations of our own naval strength. They are more likely to occur in areas which are sufficiently close to hostile territory for aircraft based ashore to be employed. Special measures will be necessary to meet this danger to shipping. Perhaps some of those which immediately present themselves will not prove successful. On the other hand the example of the recent striking progress in naval A.A. gunnery suggests that technical invention will, once again, find an antidote to a new form of attack.

Here are a few fairly obvious measures which seem worth looking into :—

Diversion away from danger zones.

Night sailing through danger zones where they cannot be avoided.

Avoiding action when attacked (for fast ships only).

Bullet and splinter-proof protection for bridge structures and machinery.

Arrangements for venting of compartments, to minimise the effect of bomb explosions.

Defensive A.A. gun and automatic-gun equipment in merchant vessels, and powerful A.A. armaments in surface escorts.

Air escorts, where resources will admit.

Air patrols in certain areas, such as those specially dangerous zones through which shipping may have to pass in daylight.

Attacks on enemy coastal air bases.

Destruction of any aircraft-carrying raiders.

Offensive operations by all arms against the enemy in some sensitive or vulnerable quarter elsewhere–even if such general offensives were not primarily part of the trade defence plan, they would still serve to relieve the pressure in that direction and would still be likely to constitute the most effective safeguard. Consider, by way of illustration, the number of aircraft that Germany was actually able to spare for raids on England in 1918 as compared with the number she might have used had it not been for the urgent needs of her Army.

I have not mentioned " cover " and " convoy." Naval dispositions will still, of course, be necessary to cover the forces directly engaged in trade protection against surface attacks, but they cannot cover them against shore-based air attack. Cover for air patrols, etc., operating over the sea could only be provided in certain special geographical circumstances.

Convoy will still retain its advantages as regards facilitating the control of shipping movements and the provision of sea and air escorts. If combined with suitable routing, it may be used to compel the enemy to fight on our ground if he wishes to attack at all. But, whereas the system of concentrating ships into groups makes their location by surface raiders and submaries more difficult–whence came much of its efficacy in the past–it does not make the task of shore-based aircraft within their routine search area any more arduous. Moreover, once a group of ships is located, it is simpler to shadow it and to organize an attack against it than it would be with a number of scattered vessels. Unless, therefore, adequate escorts can be provided, or the convoys so routed as to get full benefit from evasion, darkness, or the protection of local air patrols, these disabilities may outweigh the remaining advantages–a fact which I suggest will have to be kept in mind when considering the adoption of convoy in a future war.

There the matter of the air defence of trade must be left. But it is in many ways the most important of all the naval problems which have been raised by the advent of aircraft, as it bears upon the one aspect of our maritime situation in which public interest never wholly fails. The worst disservice that can be done by anyone taking advantage of that interest is to indulge in irresponsibilities after the manner of the journalistically air-minded. It is difficult to imagine any aspect of Imperial defence of more real and lasting importance than that the

nation should appreciate correctly the respective spheres of naval, military, and air action in protecting our shipping, its ports, and the bases from which the protective forces operate, and thereby be willing to provide all three Services with the proper and sufficient means for carrying out their tasks.

DISCUSSION.

CAPTAIN G. C. C. ROYLE, R.N.: It was the custom when we carried out operations with two or more carriers about a year and a half ago, for the carriers to work in a formation of line abreast, one mile apart. The aircraft were ranged up and kept ranged up until all the carriers were ready, and then flew off together by signal from the flagship. But the impression that I myself and all the officers in the ship had, was that such a method would not be practicable or desirable in war time. We considered that the carriers in such a close formation would offer too good a target to enemy aircraft. We also thought that it was bad practice to keep aircraft ranged on deck whilst waiting for other aircraft in other carriers to be ready. We considered that the most dangerous time for a carrier was when its aircraft were actually ranged on deck, and therefore, any operation carried out should be performed in such a way that the aircraft flew off the moment they were ranged up. It is uneconomical to range aircraft on deck in a few seconds and then have them waiting a matter of minutes for a signal to fly off. We also came to the conclusion that carriers should be spread as far apart as possible.

In view of the necessity for wireless silence the distance apart must depend on visibility range so as to ensure good visual communication. We considered that carriers should work in that sector which was most advantageous from the point of view of direction of wind and protection from enemy surface craft, that they should be placed as far apart as possible, and that all evolutions should be carried out entirely independently, squadrons of aircraft forming up at a given time and place.

I shall be glad to hear if the lecturer can give us any later information on this subject.

COMMANDER H. L. ST. J. FANCOURT: I think there would be great difficulty in carrying out the operations in the way proposed by the last speaker. If the aircraft carriers were spread in the way he described, squadrons forming up would find it very difficult to get into formation on squadrons from other carriers preparatory to a massed attack. I think most of us are of the opinion that a combined attack by a number of squadrons of aircraft is far more effective than an attack made by squadrons coming in singly, or at intervals of perhaps two or three minutes, which would be likely to occur if there were difficulty in squadrons maintaining touch.

The proposed method might be satisfactory if carried out in fine weather conditions; but in bad weather or low visibility conditions it would lead to difficulty in squadrons flying off, and delay in their forming up.

ADMIRAL SIR FRANK LARKEN: With regard to the Lecturer's remarks about aircraft spotting, and especially the point he made that when the ship's outline could be seen spotting would be difficult, would not that be just the very time when it would be difficult to rely on the aircraft being up? It seems to me that the meeting of the fleets might be so sudden that aircraft would not have time to get into the air, and when the first salvo was fired there would be no air spotting. Of

course, ships would then have to rely on their own spotting. I suppose that contingency is provided for.

CAPTAIN E. ALTHAM, R.N.: Can the Lecturer tell us whether it is anticipated that, in fleet actions by day, aircraft will be able to function as an antidote to destroyer attack?

SEADROMES [1].

An invention has been brought to my notice quite recently which may possibly introduce entirely new aspects of the influence of aircraft on trade routes in future wars. I expect even many of those who have heard of Seadromes regard them as merely theoretical devices, but when I asked the opinion of a great expert on naval construction, he gave me to understand that they should by no means be regarded in that light; moreover, experiments which have been carried out with tank models go far to justify this new form of floating, ocean aerodrome. I hear that preparations for the construction of the first Seadrome are in an advanced stage in the United States.

This leads one to the following line of thought. Hitherto we have regarded air attack of shipping beyond the range of action of shore-based aircraft or in waters where carriers are not likely to be operating as being outside the scope of air warfare; but if we are going to have, as is proposed, these Seadromes dotted at 600 mile intervals right across the Atlantic, possibly also down the East coast of South America, in the Mediterranean, down the western coast of Europe—all of which are contemplated—I suggest that we shall have to take into consideration the possibility that these floating aerodromes will be used as jumping-off or landing-on places for enemy aircraft—in other words, as mid-ocean aircraft bases. There may come a time when this will appreciably affect our whole outlook on the question of the use of aircraft against shipping. Conversely, of course, there will be the possibility of our using Seadromes as bases for aircraft to defend our shipping. In other words, the day may not be very far distant when even the great oceans of the world will have to be included in those areas where aircraft will play their part strategically and even tactically.

In reply to questions, CAPTAIN ALTHAM said that the question of anchoring Seadromes in as much as 3,000 fathoms had been taken into consideration and provided for by the inventor. So far no proposals had been made to fortify them, but aircraft themselves could, of course, form some sort of defence.

Seadromes would be very hard to sink, although it would not be difficult to damage their flying deck.

The whole project was still untried on a full scale, he was only putting forward the mere outlines of the situation which might arise if they proved successful.

He believed it was estimated that Seadromes would cost about £1,000,000 each to build.

THE LECTURER.

With regard to carriers operating in company, it seems to me that considerations of vulnerability to air attack must depend on what form of air attack one is expecting. When faced by high bombing attack, I do not think there would be much difference between being one mile apart and being several miles apart; but if the carriers were in a closer formation they could concentrate their A.A. gunfire.

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[1] See the article in this Journal, p. 343.

If attacked by torpedo aircraft, I should think it would be preferable for the carriers to be separated, in order to give greater freedom of movement and to allow the closer range weapons to be brought into full play. To the threat of surface attack, I think the only final answer is to provide the carriers with one or two cruisers to protect them. Whether we can spare cruisers for that is a different matter. If cruisers are so attached to the carriers, it might be preferable to keep the latter fairly close together, to facilitate the work of their protective force.

As far as the air side is concerned, I do not see why there should be any great difficulty in forming up striking forces with the carriers up to seven miles or so apart, and such separation should make no difference to the commencing of air searches since the aircraft have in any case to go to some collective starting point other than their carriers.

With regard to the question about aircraft spotting. One has always to consider cases where spotting aircraft may not be available, either through ships having already been in action and lost their spotting aircraft, or through contact taking place so unexpectedly that there is no time to launch aircraft before fire is opened. But I do not think that the risk of these eventualities reduces the value of aircraft spotting when it *can* be provided, nor should it stand in the way of our investigating the tactics for gaining the greatest advantage out of aircraft spotting when it is available. Incidentally, surprise day contacts should be less common in the future than in the past, and the warning that reconnaissance aircraft can give even in bad weather should enable a fleet to get its spotters into the air in time.

With regard to the use of aircraft against surface torpedo craft, that is possible, and is an activity at present envisaged as one of the duties of fighters. But their use for this purpose argues possession of very large numbers, and I think it is generally held to be secondary to other uses which must be provided for first, namely opposition to hostile attacking aircraft and protection of our own spotters.

With regard to the construction of Seadromes, I regret I have no idea of the details of the scheme at all. But it seems to me if such a structure is misused by the country to which it belongs—that is if it is used for belligerent purposes by a "neutral" owner—it will be in the same position as any other "neutral" possession whose owner behaves in that manner, and will be liable to retaliatory action. I do not think any commercial venture could afford to fortify things like Seadromes, especially as that would be a confession that they were going to be used for war purposes. And if not fortified they would be comparatively easy to attack and destroy.

THE CHAIRMAN.

There are two difficulties in considering air work at sea, which are very often forgotten by those who have not had anything to do with it. Visibility from the air over the sea is rarely greater than it is from a surface ship, and often it is less. The idea that some people have that from the air you get complete visibility to the horizon always is false.

The other difficulty is this: aircraft are sent out to locate an object—it does not matter whether they start from a carrier or from the shore; they sight the object—a convoy, squadron, or whatever it may be, and they shadow it. But their navigation is by "dead reckoning," and the longer they shadow and the more numerous the alterations of course, the more it deteriorates until eventually the positions they signal may be inaccurate. The striking force sent out from the shore or carrier to attack the object can only work on the reports received, and

its own navigation, in turn, may be inaccurate, especially over a long distance. There is a real difficulty in getting a striking force on to an object out of sight of land at sea, and once it has got to a wrong position it cannot afford to waste much time in searching.

The idea that an aircraft has only to sight a ship and it can hit and probably destroy her is a fatuous one; there are too many practical obstacles of which those conversant with all forms of warfare are well aware.

The LECTURER spoke about war conditions: I should like to stress one little point that he mentioned, namely the developments in modern anti-aircraft fire. People are still inclined to think of the millions of rounds fired in the War compared with the number of aircraft brought down. Developments in accuracy and fire power since the War have been very great indeed. A modern battleship and, of course, more so a squadron, with its anti-aircraft armament has an extraordinarily high concentration of power, and for dealing with attacks, large or small, has a very great output; similarly with the development of short range anti-aircraft fire which deals with diving and torpedo bombers, etc. Diving bombers are very much to the fore at the moment: their object is designed to dive on to a target which may be and generally is thoroughly well armed. The guns are, of course, actually on the target itself, and the aircraft has, therefore, to dive straight down their line of fire. This fact is sometimes forgotten by those unaware of naval methods of fighting.

With regard to other war conditions which we do not often see in peace time, there is the question of speed. Attacks in peace time are carried out on a ship moving about comparatively slowly, for the sake of economy of fuel. As speed goes up, avoiding action becomes much more easy for the ship, and the difficulties of hitting her become much greater for aircraft.

Again, the protection of ships is advancing rapidly. The battleship is built to stand an immense amount of punishment from guns and underwater attack; she must be able to stand the same amount from the air.

Coming to a few more general remarks, the air work of the fleet is essentially of a naval character, and differs fundamentally from what might be called shore air work. The advent of aircraft has not changed the fundamental principles of naval work at all; the principles of searching, spotting, shadowing, and other activities are unaltered whether the work is carried out by surface ships or by aircraft. Hence the use of aircraft to assist naval work must be the study of the naval officer whose profession it is to conduct war at sea. The same applies to offensive action. Torpedo attacks, bombing, and so forth are a matter of naval tactics, and the study and development of naval tactics, which includes naval air tactics, must be conducted by naval officers. Even in air fighting for defence purpose conditions at sea are different from those on shore. The tactics of air defence, the working in of the fighters, and anti-aircraft gunnery, and so forth, are all different from those on shore and deserve special study, and who can study them better than the naval officer himself?

It must be remembered that the protection at sea on the trade routes of food and raw materials, including petrol and oil for the whole of our mechanized Army, and the whole of our Air Forces, is essentially a naval commitment. The oceans are very wide and our commitments cover all of them. The air is a new factor, but it has not altered fundamental naval principles by one whit.

The customary votes of thanks to the Lecturer and to the Chairman were then carried by acclamation.

SEADROMES [1]

By G. Oswald Williams

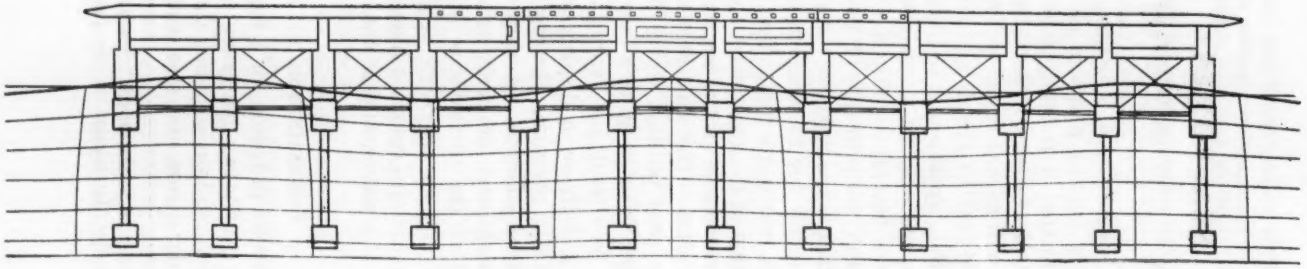
A SEADROME is essentially a structure supported on floating columns carrying a landing platform on which aeroplanes can alight, so designed that it is little, if at all, affected by wave movement. Its inventor, Mr. Edward R. Armstrong, is one of America's pioneer aviators and a well-known engineer; his designs conform to the specifications required both by Lloyds and the United States Bureau of Shipping, and successful experiments and trials have already been carried out with models, not only on a small scale in a testing tank, but also of large size under natural conditions.

In order to understand the principle of the Seadrome's flotation, it is necessary to realize that in the open sea, for which they are intended, there is no destructive action due to shoaling or to tidal waves, as on the coast. In mid-ocean, waves are undulating and their form only is transmitted in the direction of the generating wind; there is, therefore, no forward progressive movement of the water, only an up and down movement in a vertical plane. The wind drives the wave, against the action of gravity, to its crest position where the two forces balance, and the mass then changes from an up to a down movement, until it is in the trough position. As a result the hydrostatic pressures in a wave vary considerably, and a decrease in displacement is compensated by an increase in hydrostatic pressure, thereby maintaining constant buoyancy of the Seadrome columns. A ship constantly changes its centres of gravity and buoyancy, interferes with the progression of the waves, and is subjected to the tremendous energy thereby released; a seadrome, on the contrary, has its centre of gravity eight feet below its centre of buoyancy, maintains constant buoyancy, does not interfere with the progression of the waves, and is not, therefore, subjected to that energy.

Construction.

The present design makes provision for a steel deck, 103 feet above sea level, supported by thirty-two buoyancy tanks connected to the deck by streamlined steel and iron columns, the whole forming a deep truss composed of tubular struts and steel cable ties encased in iron

[1] This article is a summary of a lecture on "Seadromes," with cinematograph photographs of tests, given by the author in the Institution's theatre on 13th February, 1935.



A 1,500-FT. SEADROME IN 600 × 30-FT. WAVES, SHOWING VARIATION IN BUOYANCY

pipes. These tanks are arranged in four rows, each outer row having four tanks and each central row having twelve tanks; they are spaced longitudinally at 125 feet intervals. Lower columns extend down about 125 feet from the buoyancy tanks to support the ballast tanks, giving a total depth of 208 feet below sea level. All parts above the water-line are streamlined to reduce wind resistance. The lower columns telescope into the upper streamlined columns, to facilitate erection in docks of 28 feet depth. The record of iron sailing ships, according to Lloyd's Register of Shipping of 1930, shows a total of 162 iron sailing ships in commission, all of which are over 40 years old; this, and the life history of anchored lightships, supports the opinion that any corrosive action on the Seadrome structure will not affect its strength or performance during the first twenty years of its life. Special rivets are specified in order to minimize corrosion resulting from electrolytic action where exposed to sea water. Decks and bulkheads divide each buoyancy tank into seven water-tight compartments; electric bilge pumps will drain seepage; compressed air will be used to clear all compartments of water, if necessary; and all compartments are accessible for maintenance and repair from the inside. Special paints are used to counteract corrosion.

The principal dimensions and weights of the Seadrome are as follows:—

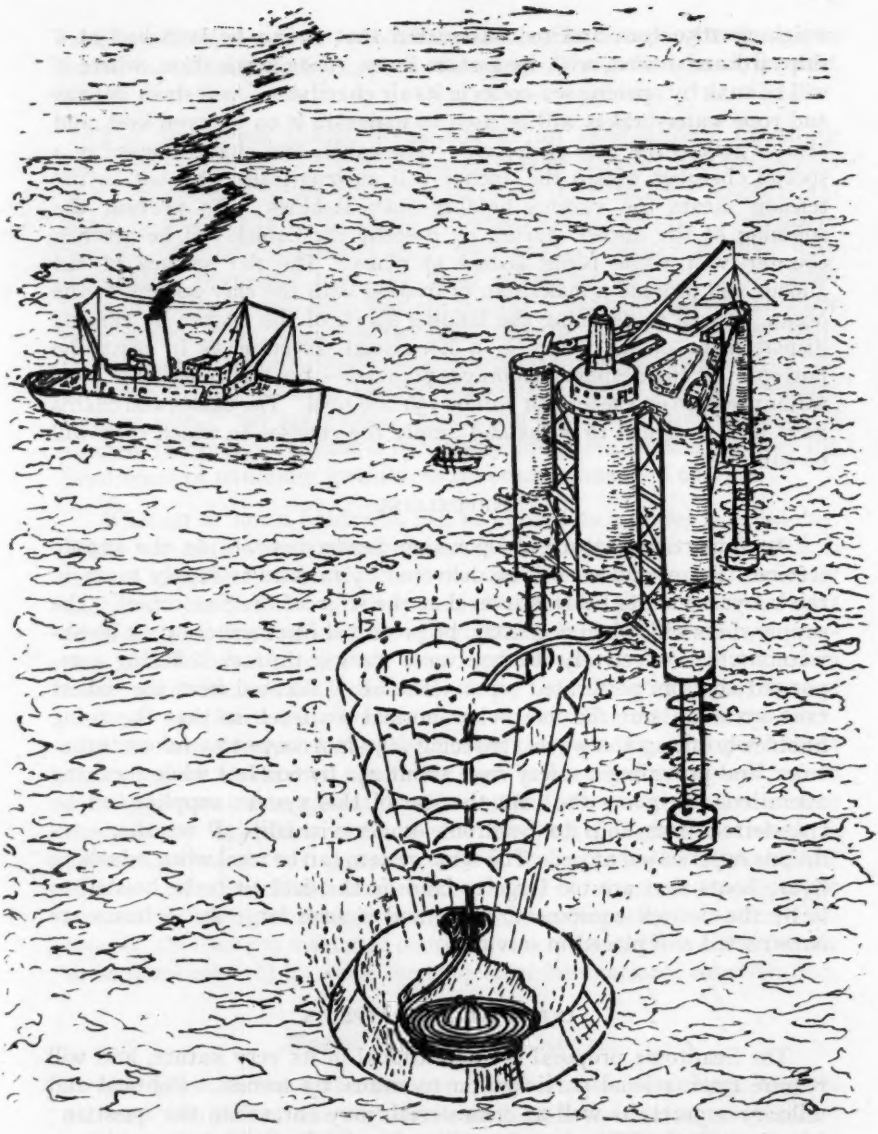
	Feet.
Length of landing deck	1,500
Width of landing deck, maximum (centre)	300
Width of landing deck, minimum (ends)	150
Draft in service condition	208
Draft in construction process	28
Draft in assembly process	34
Draft in towing condition (partly ballasted)	50
	Tons.
Light weight	26,230
Petrol	259
Fuel oil	308
Lubricating oil	45
Fresh water	485
Drinking water	70
Circulating water	25
Crew, stores, etc.	140
Sand ballast	14,230
Water ballast in ballast system	20,380
Water ballast or reserve dead weight	3,038
Total displacement	65,210

In addition to the unobstructed flight deck, a second deck will provide accommodation for the crew, air pilots, etc., and hotel accommodation for passengers, etc. Below this a 28 ft. hangar deck is provided, with lift connections to the flight deck, for the storage, repair and inspection of aircraft, etc. A fourth deck will house machinery for operating the Seadrome, and its various services, lighting, radio, etc. Storage for petrol, oil, water, etc., is provided for in the buoyancy tanks in special compartments. Four electrically-driven propellors are fitted at the stern of the Seadrome, with a total thrust of 100,000 pounds.

Anchoring.

Anchoring a ship as large as a Seadrome in mid-ocean would be impracticable, because the movement resulting from heavy wind and wave action would probably rupture either the ship or the anchorage system. The openwork design of a Seadrome, however, permits the passage of the largest waves through the structure, reduces the stress on the anchorage system to the total of the wind forces acting on the parts above and the current forces on the parts below the waterline. Under the worst North-Atlantic storm conditions on the route where it is proposed to use Seadromes these forces do not exceed 72 miles per hour and 1½ knots respectively, exerting a total maximum stress of but 100,000 lbs. on the Seadrome. The Seadrome will be connected to a specially designed surface buoy by a cable capable of withstanding a stress of 500,000 lbs., providing a safety factor of 5, and dynanometers in the cable itself will automatically operate the electrically driven propellors if a dangerous tension develops. The surface buoy will also be connected to a specially designed anchor by means of suspension-bridge type cables, capable of withstanding their own weight in a depth of 60,000 feet, which will hang practically vertical almost to the ocean floor, where they will be connected to forged alloy steel chains attached to the anchor itself. By this method the cables will not foul or kink, nor be subjected to wear and tear. Appropriately protected from corrosion, these cables should last at least the life of the Seadrome. The cables will have a safety factor of 3½, and the anchor chains a safety factor of 12. The Seadrome will always lie down wind, the action of the wind on the streamlined columns and on electrically operated air fins causing it to swing around the anchorage buoy on its connecting cable into the wind; the propellors can also be used, if necessary, to bring it into the wind. Various types of snubbers can be used, if advisable, for the landing of planes.

Unlike ship anchors, which are usually of a penetration type, the Seadrome anchor will be a friction type, approximately hemispherical,



SEADROME ANCHOR BEING RELEASED

NOTE CANVAS AND ROPE WATER-BRAKES, AND WIRE AND CHAIN CABLES COILED AND LASHED WITHIN THE HEMISPHERICAL FRICTION ANCHOR

weighing 1650 tons and so constructed that it can be launched at a shipyard and towed, with its surface buoy, to its destination, where it will be sunk by opening sea-cocks in its air chambers. As it sinks, canvas and rope water-brakes will be used to maintain it on an even keel, and also to govern the rate of descent. The cables and chains housed in a special chamber within the anchor will automatically pay out as the tension shears the various holding-down lashings. To prevent the spinning of the anchor during its descent the cables will be given a counter-twist while being lashed in place. The flat surface of the anchor will provide a maximum of friction with the clay bottom of the ocean, as well as reducing the landing shock of the anchor by causing displacement of the water in a horizontal direction as it nears the bottom. At the deepest anchorages planned—about 3½ miles—the total water pressure on the anchor will be 750,000 tons. The cables and chains have been designed to withstand amply the stresses to which they will be subjected.

Refuelling.

An important feature of operating Seadromes will be the supply service. Petrol and oil will be delivered by tankers to supply tanks in the buoyancy units below sea level at the stern of the Seadromes. The supply ships will, when necessary, be protected from waves by air breakwaters which effectively destroy wave motion through diffusing compressed air from perforated pipes. The air is released from the ballast tank system about 180 feet below normal sea level, so that the rising bubbles break up the waves, reducing a 30-foot wave to a minor turbulence, and providing a safety zone about 250 by 600 feet while servicing operations are going on. By the use of this system supplies can be transferred from ship to Seadrome under virtually all weather conditions experienced at sea. The same system can be used when refuelling flying boats that are too large to land on the deck or to be hoisted to it by the derrick equipment, when and if such large flying boats are constructed and placed in service.

International Aspects.

The Seadrome proposal is international in its very nature, and will require international participation to ensure its success. Political and military aspects, as well as commercial, may enter into the question; but the principal Powers who will naturally be most interested in a North Atlantic route are Great Britain, the United States, and France. The construction of Seadromes should, therefore, be undertaken by these nations, either governmentally or through private finances. The

facilities thereby created would, however, be thrown open to all nations under a toll agreement, as in the case of the Suez and Panama Canals.

The Seadromes should be leased to an international operating company representative of these three national interests and the owners of the Seadrome patents, the latter receiving in exchange a proportional share in the capital stock of the international corporation; exclusive licences to build Seadromes over such colonial routes as they may designate; operating rights for their respective airways; and some form of bond or preference shares carrying 3 per cent interest on their construction costs. Each of the three nations would reserve the right to withdraw its Seadromes for military purposes in case of war, and the service would not thereby be disrupted unless two of the three nations were at war at the same time. Operating capital can undoubtedly be secured through prepayment by airway operators licensed to use the Seadromes of minimum guarantees covering annual toll charges.

Whether or not a Seadrome can be classed as a vessel is debatable. While it might be so classified when it is being towed or is self-propelled, such a classification would cease to apply once it was permanently anchored. As Seadromes will be anchored outside the territorial waters of all nations, their nationality will undoubtedly be governed by ownership rather than by registry. The legal aspects have been studied in many countries, and Mr. Latchford, of the United States Department of State, has declared that there would be no impediment, from the international law standpoint, to the construction, placing, and permanent anchoring of Seadromes upon the high seas. Seadromes will afford to over-ocean air transportation aids similar to those rendered to surface shipping by lightships, such as the Nantucket Lightship, which is permanently anchored approximately 60 miles from the nearest point of land. Mr. Latchford further stated that it is not necessary to do more than notify foreign governments of the intention to anchor Seadromes, this being a matter of courtesy, not of necessity. Undoubtedly these questions will be made the subject of international consideration.

North-Atlantic Air Route.

The great circle route between London and New York slightly exceeds 3000 miles; the regular steamship track is about 3200 miles; and the proposed Seadrome air-route 3600 miles. The Seadrome route would lie somewhat South of the trans-Atlantic steamship track, the first two Seadromes being placed South and East of New York, well within the Gulf Stream, beyond the coastal ice and fog zone, and below

the similar hazards originating off the Grand Banks of Newfoundland.[1] The route has been selected in order to avoid, as far as possible, ice and fog, and to provide the best meteorological conditions without unduly increasing the distance to be flown. Economic factors of air transport make it advisable to use five Seadromes on this route, the average flight distances so provided giving the most economic payloads. This route and the distances allowed for will permit aircraft to operate regularly, frequently, safely, and economically throughout the year, with all necessary radio, meteorological, lighting, refuelling, and other services now essential to their successful and economic operation over land.

The North Atlantic is the greatest trade artery of the world: over £150,000,000 is invested in the shipping thereon to serve the social and economic interests of over 300,000,000 people—practically half the civilized world. Although the first direct air crossing of the North Atlantic was made by Alcock and Brown in a Vickers Vimy bomber 16 years ago, no regular air service yet exists over this route. It is obvious that some characteristic of airway operation, other than extreme aeroplane range, is retarding the inauguration of such a service. A study of overland airways discloses that the essential which is lacking is some form of airports for refuelling and for the equally important services of meteorology, radio, lighting, etc., without which no airway can operate successfully. Seadromes will furnish this vital need.

Many alternative proposals have been made as a result of the study of trans-Atlantic questions in various countries, and it may be of interest to deal with the more important of these proposals :—

Dirigibles. The slower speed, infrequency of service, and enormous capital investment required for dirigibles prohibit their successful competition with heavier-than-air craft; hence no dirigible routes are now competing with established overland airways. Equally they would be unable to compete with a Seadrome route across the North Atlantic which would offer at least a daily service, linked up with eight or ten national routes, between the principal cities of Europe and America, at rates probably lower than present first-class steamship fares.

Commander Hunsaker, designer and builder of the ill-fated United States Navy dirigible "Shenandoah," put the case for Seadromes very

[1] The following is the proposed route :—

Seadrome	1.	2.	3.	4.	5.
Latitude ...	38° 30′ N.	39° 15′ N.	40° 10′ N.	41° 00′ N.	44. 30′ N.
Longitude ...	63° 00′ W.	50° 40′ W.	37° 50′ W.	25° 00′ W.	13° 00′ W.
Depth (Fms) ...	2,800	2,800	2,600	1,900	2,700

concisely when he said, " The airship cannot compete effectively with the airplane on routes where high mountains are to be crossed, where very high speed is essential, or where a very frequent schedule of departure is required. Also where refuelling stops are available at frequent intervals, as on inland and coastal routes, the airplane is much more economical." [1]

The Long-range Flying Boat. Great Britain, France, Germany, Italy, and the United States have been striving to produce long-range land planes and flying boats for trans-oceanic air routes. Each new machine is heralded as the long awaited solution of the problem, but so far none has been produced of sufficiently long-range flight, and with the necessary extra fuel allowance for head winds, etc., required for safety, and capable of carrying an economic pay-load. On the other hand, flying boats already exist which could be put into operation in conjunction with Seadromes and thereby establish both trans-Atlantic and trans-Pacific routes.

High-Altitude Flying. Assuming that machines may be designed capable of safe flying at over 20,000 feet, and at twice the speed possible at normal altitudes, the question of economic pay-load still applies; one refuelling stop alone would double the pay-load of such aircraft. Without refuelling they could not compete economically with ordinary aeroplanes refuelling at Seadromes. The successful development of such aeroplanes is at present so theoretical that it is not proposed to give the question further consideration in this article, other than the following general remarks regarding future improvements in aeroplane efficiency of design and performance.

Aerodynamic Efficiency. Advancement already achieved in aerodynamic efficiency is such that it is doubtful whether future improvements can increase the efficiency of aeroplanes more than 20 per cent.; it is doubtful whether a 10 per cent. improvement in streamlining can be effected. Engine weights per horse power have already been reduced to almost the physical limits possible; fuels of higher octane rating increase the power output of the standard engines, but specific fuel consumption increases considerably, and probably heavier engines would be required to withstand the increased pressures. Air screws of variable pitch type are already very close to their maximum theoretical efficiency, and future improvements will probably be confined to questions of mechanical design, construction, and maintenance. Generally speaking, it is problematical whether future improvements in

[1] See Report of the United States Federal Aviation Commission (of which Commander Hunsaker was a member), January, 1935, p. 203.

any direction can increase present efficiency more than by a nominal percentage; whereas payloads resulting from refuelling at Seadromes will be increased by several hundred per cent.

Seadrome Economics. The cost of constructing, towing, and anchoring a Seadrome, completely equipped, is estimated at about £1,000,000. This is not greater than the cost of one of the principal airports of the world. If a suitable island existed on a trans-oceanic air route, £1,000,000 would certainly not be regarded as an excessive purchase price, even if an additional £1,000,000 had to be spent on it to construct an international airport. Trans-Atlantic Seadrome airways would probably have much the same proportion of various classes of traffic as do the continental airways of the United States; i.e., 85 per cent. passenger and 15 per cent. letters and parcels. The present volume annually crossing the Atlantic by ships consists of approximately 7,600,000 lbs. of letter mail, 65,400,000 lbs. of printed matter and parcels, and almost a million passengers, of whom 200,000 are first-class fares. Once airways are inaugurated across the Atlantic a reasonable portion of this business will certainly be transported by air. It has been conservatively estimated that airway operators, obtaining maximum pay-loads through the use of Seadromes, would realize adequate profits at moderate fares after paying a Seadrome toll of 10 per cent. of the gross income derived from such loads; and the income thereby accruing to the Seadrome Company, after deducting maintenance and operating expenses, insurance, depreciation, interest charges, etc., should enable the repayment of the construction costs within a few years, and assure a reasonable return to their owners, without including the profits from various sources, such as hotel and other concessions, profit from sale of fuel, etc. Detailed estimates have been prepared, and although it is impossible to predict what proportion of the present trans-Atlantic business will go by air, it is obvious that a 3,500 mile airway serving over 300,000,000 people should pay a reasonable return to owners and operators alike.

Other Types of Seadromes.

The Seadrome type of construction is not limited to commercial airports; it is also adaptable to other uses. Chief amongst these, and for which plans have already been made, are the following:

Radio and Meteorological Beacons. A beacon has been designed to provide radio and meteorological services in mid-ocean, where there are no Seadromes, similar to those on overland airways. These beacons will consist of modified Seadrome structures of five columns, and will contain all the necessary machinery and personnel to furnish meteoro-

logical information, radio direction beams, radio-telephone services, lighting (visible under ordinary conditions and at reasonable heights for a hundred miles), refuelling, and other emergency assistance in case of aeroplanes having to make forced landings at sea, etc. Such services are essential to trans-oceanic flights, and the lack of them has been responsible for the failure of many pioneer attempts. These beacons would similarly provide essential services to ships at sea and would be valuable adjuncts to the present Governmental meteorological services. The type of construction gives them stability during storm conditions in the same manner as a Seadrome, and they can be anchored anywhere where there is sufficient depth of water.

Aircraft Carriers. Plans have been prepared for the adaptation of the Seadrome principle to aircraft carriers. Supported by a series of slender hulls, these vessels could be propelled at reasonable speed to any desired point, complete with their complement of men, machines and fuel, etc. By the introduction of water ballast these hulls would become, in effect, ballast chambers ; and the telescopic deck-supporting columns would be extended down to their full length, thus converting the vessel into a Seadrome free from the effects of wave action. Not having the conventional hull of a ship, the destruction of such a vessel, equipped to defend itself, would be likely to prove very difficult, whether by means of torpedoes or aerial bombs ; not one, but several, of the buoyancy chambers below sea level would have to be destroyed in order to sink such an aircraft carrier. When so desired the water ballast can be removed, the columns again telescoped, and the entire structure made to reassume the properties of a self-propelled ship.

Floating Dry Dock. Another type has been designed, also capable of self-propulsion at a reasonable speed and convertible from ship to Seadrome status, and vice versa, but incorporating a floating dock sufficiently large to take a 10,000 ton cruiser.

On closing the crippled ship, the structure would be converted into a Seadrome, the water in the dock and in a large area around the crippled vessel being reduced to a minimum of turbulence by the use of compressed air, when the vessel could be warped into the dock for repair. The design of this structure provides a flight deck for aircraft, hangar facilities, etc., and two additional docks for the accommodation of other, smaller naval vessels, if so desired, while the disabled vessel is being repaired.

Conclusion.

In conclusion it is submitted that the Seadrome constitutes a new form of marine construction adaptable to many uses for commercial

and naval purposes, unlimited as to size or shape, and capable of self propulsion. It furnishes a means of constructing various types of vessels, if we may call them such, capable of being anchored almost anywhere in the seven seas, and practically immune from wave motion in storms. By the selection of suitable sites for such structures in the Mediterranean, Arabian Sea, and Indian Ocean, a fully serviced airway could be established from London to Australia without flying over foreign countries and independent of them for airport services of all descriptions. By using Seadromes as planned in the Atlantic Ocean, in conjunction with the Canadian airways and Seadromes and British islands in the Pacific Ocean, a similar westward service to Australia could be inaugurated. Both eastward and westward routes would take about four and a half days from London to Australia ; the two routes would link up to provide an All-Empire route around the world. Once the riddle of trans-oceanic long-distance flights is solved, unquestionably much of the existing traffic will use the faster method of travel provided by airways. The Seadrome makes possible safe, frequent, regular, and well-serviced aiways over oceans, upon the most economic basis of operating costs.

The entire question has been investigated by several governments ; an appropriation of £1,600,000 has been approved in principle by the United States for the construction of the first commercial Seadrome, and an appropriation of £400,000 is being considered for the construction of Seadrome beacons for anchorage in the Pacific Ocean. The French Government recently appointed a Commission to go to the United States and make a thorough investigation of Seadromes, and although no official report has yet been made by the Commission pending the return of all of its members, it is anticipated that they will recommend the construction of Seadromes by France. It is also expected that France will construct Seadrome beacons for use on her South Atlantic air service.

The Seadrome question has been brought to the attention of several departments of the British Government and has been investigated in Washington by representatives of several other countries.

THE MILITARY POSSIBILITIES OF THE AUTOGIRO

By MAJOR J. C. F. HOLLAND, D.F.C., *p.s.c.*, Royal Engineers.

BEFORE considering the possible military uses of the autogiro, it is necessary to appreciate its present characteristics and form some estimate of the extent to which it may be developed technically. This aircraft was described in some detail in a recent article in the JOURNAL,[1] so that a brief recapitulation of its essential features will suffice. It can carry two men; the top speed is 120 miles an hour; and the petrol capacity will enable it to fly something like 250 miles; it can, to some extent, "sit" in the air remaining, not stationary, but approximately so for the time being; it can land almost vertically, and take off in less than 50 yards.

The technical limitations of its future development may be summarized in the following extract from a lecture delivered at the Royal United Service Institution[2]: "the forward speed of an autogiro must always be less than the forward speed of a corresponding aeroplane because of the wing efficiency. By clipping the wings of the rotor, increased forward speed may be obtained, but this would annul the essential merit of slow landing. Increasing the dimensions of a gyroplane necessitates a disproportionate increase in the dimensions of the rotor, with a corresponding increase in structural difficulties. Thus it seems that gyro-aircraft will remain relatively small in size, and we need not anticipate the supersession of the fixed wing aeroplane in the high speed and large scale classes."

The foregoing indicates that the autogiro may possibly be limited in its development in favour of perfecting the characteristics which it already has: i.e., it is a small machine with a useful but not great

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[1] "The Autogiro as a Service Weapon." By Captain H. J. Parham. R.U.S.I. JOURNAL, August, 1933.

See also *Militär Wochenblatt*, 11th January, 1935; where our constructional programme is commented upon.—EDITOR.

[2] "The Development of Aircraft and its Influence on Air Operations." By Squadron-Leader R. V. Goddard, R.A.F. R.U.S.I. JOURNAL, August, 1934.

speed, capable of landing almost anywhere, and of holding almost one position in the air when necessary. Added to this, it will probably be simple to construct, and maintain, and very simple to fly. It appears reasonable to hope that the type being developed for military purposes will carry a light machine gun and a certain amount of ammunition in addition to two men.

It is under these conditions that the military possibilities of the autogiro have to be considered. Its uses for observation and intercommunication were clearly set forth in the above-named article; but the autogiro seems to possess still further possibilities which will certainly come to light in the near future when it may be in common use.

The first of these possibilities is suggested by the use already made of it by the police in connection with the control of great streams of traffic on occasions like the Derby. Internal security operations are an ever present consideration for the forces of the British Empire, and the potential uses of autogiros in this respect would seem to be well worth investigation. In all great cities, troops are mainly required for reinforcing the police in piquetting and patrolling, and, in the ultimate resort, for firing on a mob. It is obvious enough that an autogiro could be of the greatest use in watching movements in a city since, unlike an aeroplane, it can hover over streets; and it is also clear that in this respect it is better than any ground patrol for providing early intelligence. Moreover, the moral effect of a few of these machines continuously surveying the scene from a low height over a riotous Eastern city would be very great.

There are also more serious situations, such as the assembly of dacoits or dangerous revolutionary bodies in jungles, hills, and bush country in order to issue therefrom for raids or similar activities. At present the only cure for such situations is a " drive " by infantry, or by cavalry when the country is suitable. These drives cannot as a rule be assisted by tanks since the nature of the ground generally precludes their employment, while the help to be derived from aeroplanes, though useful, is limited because the country is usually too close for rapid aerial observation to yield definite information, and because targets for air attack when they do present themselves are small and fleeting. Here again autogiros might be most effective since from them the search of any area can be slow and detailed; if armed with machine guns they might even have a decisive effect. On the North-West Frontier of India, or in countries such as Kurdistan, there are many further possible uses for these machines. Provided that it could use a machine gun, an autogiro, being able to fly very slowly, could almost be regarded as a substitute for the piquetting of a column.

In any case, its power of detailed observation might often be more efficacious than that of an aeroplane, since the enemy is usually to be found only in small parties using all available natural cover. It may not be too remote a contingency to contemplate autogiro parties landing at some village in the hills to arrest some noted malcontent before his activity has had time to foment a disturbance which would call for more extensive forces before it could be quelled.[1]

At first sight it might seem that there is not likely to be much scope for the autogiro in major operations apart from observation and intercommunication—functions which are already recognized. Nevertheless, we must remember two outstanding features of future warfare :

(*a*) The great power of the defence, which is largely dependent on facilities for supply ;

(*b*) The effect of aircraft which may exceed anything hitherto experienced.

Now the most economical objects for air attack are large targets. Owing to the difficulty of obtaining direct hits on small targets, it is unlikely that bombing attacks will often be directed against them ; yet it is the latter which may be of the greatest importance. Its lines of communication are vital to an army : normally they consist of roads and railways with many bridges. Even if cross-country mechanical transport is developed so that it is capable of maintaining the supply services, it will still have to use bridges and other unavoidable defiles. This being so, there seems to be a case for exploring any method whereby an enemy holding a defensive position can be seriously hampered, or the defence weakened by easier ways than the costly method of direct attack. Tank brigades, operating like the old independent or army cavalry may, or may not, be very effective. The tank is a relatively complicated machine, needing much mechanical maintenance and a long supply column to sustain its operations ; the latter being highly vulnerable, provides an attractive target for any kind of mobile force. But the autogiro appears to offer distinct possibilities for this role.

The *modus operandi* which suggests itself is analogous to that of cavalry riding to their objective and then dismounting for the final work. Since places where autogiros could land will surely abound, this does not seem to be too improbable. Obviously the larger bridges will be defended in some degree, and the amount of explosive required for efficient demolition would be beyond the capacity of the small machines

[1] For a further review of the possibilities of the use of the autogiro in small wars, particularly for the defence of communications, see *Militär Wochenblatt* for 25th July, 1934 ; p. 139.—EDITOR.

to carry; but all culverts and smaller bridges cannot be defended, and although the destruction of any one of these might only occasion a temporary hitch in the working of the line, the cumulative effect of such raids might be serious.

The obvious answer is that parties in autogiros attempting any such enterprise would be destroyed by enemy fighter aeroplanes or by the fire of troops from the ground while still on their way, or by being attacked after landing. It would appear that the attack of fighter aeroplanes on autogiros would be like that of hawks on weaker birds; but there are ways in which such disasters could be avoided. For one thing, fighters cannot remain in the air continuously over the whole area adjoining the lines of communication. For another, the autogiros need not necessarily fly high and may be able to follow the natural features of the ground in safety, since it is often extremely difficult from a height to spot machines flying near the ground. Even if the worst happened, it would be possible for an autogiro to go to ground, seeking any cover available, and then use its machine guns from the ground against the fighters. Moreover, there is the possibility of conducting such raids in darkness, immune from enemy fighters. To quote the above-named article once more, " it is just conceivable that it (the autogiro) may not prove such a ' sitter ' as some critics would have us believe, for, as one well-known pilot puts it, ' the ability to keep on the inside of the circle may alter all the accepted ideas of air fighting '."

Interference from the ground while on the way is on the whole improbable, since such enterprises should be carried out by coming in wide of the main fronts, and flying over unoccupied country. Being able to land almost anywhere, autogiros could make halts on such journeys if necessary. The demolition parties, once landed, would not be entirely at the mercy of enemy troops on the ground; methods of self-defence suggest themselves. Firstly, there is the obvious recourse to the machine guns carried by the autogiros which could be dismounted and set up on the ground. Secondly, as the autogiro can remain more or less stationary in the air, there is the possibility of keeping some of the machines in the air as a covering force. At the worst, the party could re-embark and fly off.

Tanks, of course, would certainly defeat the autogiros, and the arrival of enemy fighters might cause some difficulty; but, on the other hand, tanks and fighters are not likely to be retained in large numbers to guard lines of communication. Alternatively, if they should be retained in large numbers for this purpose, so much the greater the chances of success for the main operations.

The movement of these autogiro parties wide of the main fronts

and over unoccupied country raises the question of maintenance. It has recently been reported that an attempt is to be made to fly from England to the Cape in an autogiro, the pilot proposing to proceed by 500-mile stages. Now the targets that have been named will not lie in remote areas of the enemy country, but will be more intimately concerned with the operations of the armies, and may be within the normal range of autogiros. It is also reasonable to assume the organization of fuelling points away to a flank with the aid of heavy transport aircraft. If such fuelling points lay fifty or more miles away from the objectives, they might be reasonably safe from enemy air attack in view of their small size, and autogiros could be maintained in petrol by returning to the fuelling point from their zone of operations with comparatively little loss of time. When the enemy's line of communications runs near the coast, as did the Turkish communications leading to the Palestine front, the autogiros might be based on ships.

Another possibility is that autogiros should form part of the modern mobile division, being maintained and occasionally protected by it. They would then be employed in much the same manner as aircraft with a fleet, accompanying the mobile division and flying off from its area for operations whenever necessary.

Finally, consider the possibilities of attacks on railways, trains, lorry convoys, small columns of troops, and other movements. The anti-aircraft defence of definite localities can be organized with a considerable degree of efficiency, but it is more difficult to protect moving bodies. Equally the normal air attack of smaller moving bodies is not often a productive proceeding, because of the difficulties of hitting the target from a height, and because the alternative of low flying attack may be too expensive to warrant its use save on special occasions. A close approach by the attack is dangerous in the face of anti-aircraft fire. The dive onto the target offers just that predictable movement to the anti-aircraft gunner which he hopes to get; yet it is the only means whereby the single-seater fighter can bring its machine-gun to bear. This close approach is what makes the proceeding an extravagant one, unless there is a complete absence of fire from the ground, which is not likely to be the case in future. There are consequently inherent weaknesses in the low flying attack of aeroplanes, which cannot be eliminated, but which would not occur in the case of the autogiro "sitting" at a distance. The advantages as between the column or convoy being attacked and the autogiro would lie with the latter, since it would have the initiative in change of position. Ranging from the autogiro would be comparatively easy from the splash of bullets on the ground, whereas the opposition fire would be handi-

capped by considerable difficulty in ranging. On the one hand there would be a defined, probably stationary target, and on the other a very small target that could stand off and alter the conditions of line and elevation when necessary.

The moral effect could be so great that there might be advantages in employing autogiros for fulfilling those functions formerly allotted to irregular cavalry, provided that they operated by coming in over unoccupied country, and aimed at continuous harrying of the enemy rear services.

Even if technical limitations are such that neither the size nor the speed of the machine can be increased, the perfecting of the characteristics which it already possesses will put some of the above suggestions into the category of probabilities; in view of present aerial development the latter may not be so distant. In the case of a European war, the use of autogiros may be limited, but there seems more than a possibility that for internal security, and even for the major expeditions of the British Empire, autogiros might be used very effectively. If this is true, there is some reason to argue that an extended introduction of the machine for use in overseas forces might render the Home Army more free to organize according to the requirements of modern European warfare.

It is suggested that these uses of the autogiro may be more properly the province of the Army than of the Royal Air Force. The objectives would be more intimately concerned with that Service, while the operations of such forces would be usually conducted in ways analogous to those already in use for certain arms of the Army. Lastly, it is highly probable that, in the future, autogiros will be extensively used for ordinary purposes, particularly in England, and to some extent overseas; if so, there will be a potential reserve of these aircraft available for any military purpose.

STRATEGIC MOVEMENT BY RAIL IN 1914

By MAJOR C. S. NAPIER, R.E.

PART II. STRATEGIC MOVEMENT DURING OPERATIONS.

DEPLOYMENT of the whole nation in arms, as in 1914, involves a sum of rail movement exceeding in volume any later concentration or transfer of forces within a comparable period of time; but the circumstances of strategic movement during operations may render the latter enterprise more difficult, and no less critical, than the initial concentration. Thus the transportation problem in August, 1914, was, for France and Germany, formidable mainly from its bulk: all routes leading to the frontier were, and had to be, employed for intensive troop movements over a period of weeks. But at the same time certain factors were operating to simplify the problem. Ample time had been devoted to its study, to the improvement of facilities, and to the preparation of detailed movement programmes; provision had been made for the virtual suspension of civil traffic; the flow of movement was all towards the frontier from large mobilization centres; the railways, having adjusted themselves during mobilization to the new conditions of working, were at a very high standard of efficiency; and the enemy, similarly engaged, was too preoccupied to interfere with movement. Except the last, these favourable conditions will, generally speaking, continue to hold good upon the outbreak of any future war.

Compare the situation later. Large troop moves are initiated at short notice under circumstances often of extreme urgency; the military situation during the period of the move may be far from stable; movement is apt to be lateral, cutting across other currents of traffic; the routes available, their capacity, entrainment and detrainment facilities have to be taken as they stand; the demands of munition factories, now in full production, are insistent, while other military traffic is swollen by drafts, by the evacuation of sick and wounded, and by an increasing consumption of ammunition and engineer stores; damage to track and rolling stock by enemy action, wear and tear of equipment, and the exhaustion of personnel under prolonged strain is slowly reducing technical efficiency; lastly, the enemy may be free, and anxious, to apply his energies to interference with movement.

This concatenation of disturbing factors clearly distinguishes the problem of strategic movement during operations from that of the

initial concentration as understood in 1914. Whether this distinction was sufficiently appreciated before the War or not, the military railway authorities and the technical executive rapidly adjusted their methods, under pressure of necessity, to the new conditions. But before turning to the technique it will be well to indicate the scale of strategic movement in mobile warfare and to set the technical problem against its proper background. For this purpose no campaign is more illuminating than that upon the German eastern front during the autumn of 1914. With an efficient network of railways extending along the whole length of the Polish frontier the Germans enjoyed almost complete freedom of manœuvre, and were not slow to take advantage of it. The outline of this campaign which follows is in no way a critical examination of German strategy, it merely summarizes the transportation achievement.

The Strategic Employment of Railways on the German Eastern Front in 1914.

The comparative density of the railway system on either side of the frontier is shown on Plate IV. It will be seen that the German system, and in effect the strategy of the campaign, hinged upon two double-line laterals: Korschen–Deutsch Eylau–Thorn–Ostrowo–Kattowitz, rather close to the Polish frontier (referred to hereafter as Route A), and Königsberg–Marienburg–Schneidemühl–Posen–Breslau (Route B). By virtue of these laterals, encircling the Polish salient, the German High Command may be said to have enjoyed the advantage of operating simultaneously upon exterior and interior lines in point of space and time respectively.

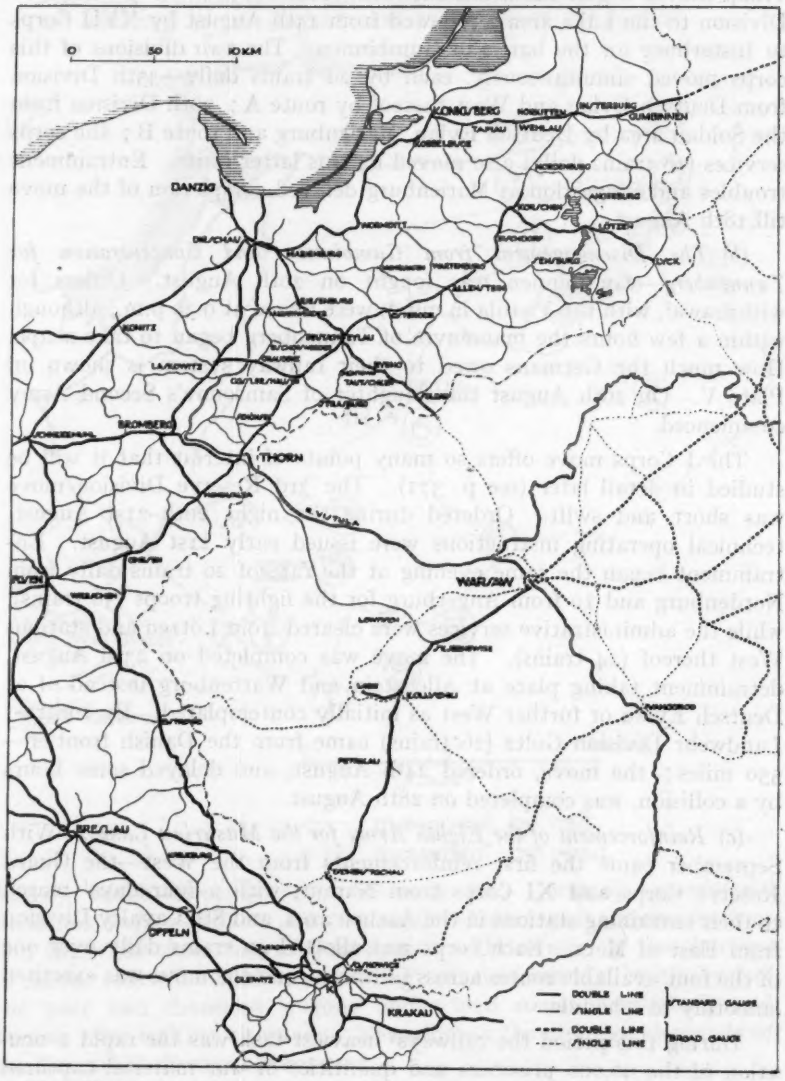
Technically, the area included the operating districts Königsberg, Danzig, Bromberg, Posen, Breslau, and Kattowitz, supplemented later in occupied Polish territory. In each the joint military and technical line commission received instructions from a Director of Railways (*Chef des Feldeisenbahnwesens Ost*) at Eighth Army Headquarters. The standard train was of 110 axles; to move a division required about 40 such trains. Normally two hours were allowed for entrainment or detrainment, i.e., with a daily 4-hour break, 10 trains a day at each military platform.[1] Appendix D summarizes all troop moves during August–November, 1914, the period under consideration.

(*a*) *Troop Moves prior to Gumbinnen.*—The initial concentration was virtually completed on 12th August; it comprised a screen along the frontier; 1st Cavalry Division, I and I Reserve Corps North of the

[1] The French preferred 3 hours if possible, i.e., 8 trains daily.

Plate IV.

THE EASTERN FRONT



K = Kattowitz.

Lakes; XX Corps at Allenstein; XVII Corps at Deutsch Eylau; 3rd Reserve Division at Hohensalza; and only Landwehr in Silesia. Troop moves began the same day with a lateral shift of 3rd Reserve Division to the Lake area; followed from 14th August by XVII Corps to Insterburg for the battle of Gumbinnen. The two divisions of this corps moved simultaneously, each by 20 trains daily—35th Division from Deutsch Eylau and West thereof by route A; 36th Division from the Soldau area by Deutsch Eylau, Marienburg and route B; the corps services (10 trains daily) also moved by this latter route. Entrainment troubles and congestion at Marienburg delayed completion of the move till 18th August.

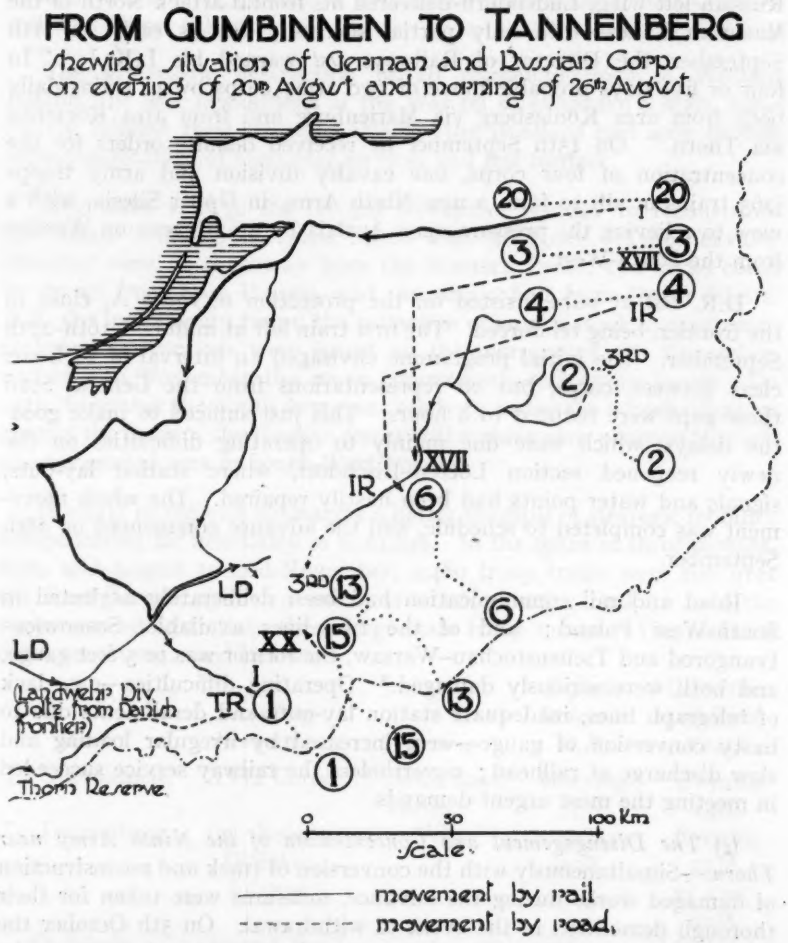
(*b*) *The Disengagement from Gumbinnen and Concentration for Tannenberg.*—Gumbinnen was fought on 20th August. Orders for withdrawal, with the Vistula in mind, were issued at 9.30 p.m., although within a few hours the manœuvre of Tannenberg began to take shape. How much the Germans owed to their railway system is shown on Plate V. On 26th August the slaughter of Samsonov's Second Army commenced.

The I Corps move offers so many points of interest that it will be studied in detail later (see p. 371). The 3rd Reserve Division move was short and swift. Ordered during the night 20th–21st August, technical operating instructions were issued early 21st August. Entrainment began the same evening at the rate of 20 trains daily from Nordenburg and 10 from Angerburg for the fighting troops (36 trains), while the administrative services were cleared from Lötzen and stations West thereof (24 trains). The move was completed on 23rd August, detrainment taking place at Allenstein and Wartenburg instead of at Deutsch Eylau or further West as initially contemplated. By contrast Landwehr Division Goltz (26 trains) came from the Danish frontier—550 miles; the move, ordered 24th August, and delayed some hours by a collision, was completed on 28th August.

(*c*) *Reinforcement of the Eighth Army for the Masurian Lakes.*—With September came the first reinforcements from the West—the Guard Reserve Corps and XI Corps from Namur, with a four days' march to their entraining stations in the Aachen area, and 8th Cavalry Division from East of Metz. Each corps was allotted 40 trains daily over one of the four available routes across Germany, and the move was executed smoothly to schedule.

During this period the railways' heaviest task was the rapid evacuation of the 90,000 prisoners and quantities of war material captured at Tannenberg; but the strain continued throughout the autumn. Besides normal maintenance traffic and the volcanic troop moves (see

Plate V.



below), which blocked traffic far back into Germany, exceptional measures were necessary for the repair of damaged communications and the relief of distress in East Prussia. Unfortunately the shortage of labour reduced efficiency in loading and turn-round: by the end of the year two thousand wagons under load round Königsberg and Danzig were waiting clearance. Nevertheless the strategic demands of the General Staff were always met.

(*d*) *Concentration of the Ninth Army in Upper Silesia.*—On 9th September, the day on which his enveloping movement destroyed the

Russian left wing, Ludendorff delivered his frontal attack North of the Masurian Lakes—with only partial success. Yet as early as 11th September the Director of Railways *Ost* warned his L.Ks.[1]: "In four or five days probable move of two army corps by 40 trains daily both from area Königsberg via Marienburg and from area Korschen via Thorn." On 15th September he received definite orders for the concentration of four corps, one cavalry division and army troops (765 trains in all) to form a new Ninth Army in Upper Silesia, with a view to relieving the pressure upon Austria by an advance on Warsaw from the South-West.

D.R. *Ost* at once insisted on the protection of route A, close to the frontier, being reinforced. The first train left at midnight 16th–17th September. The initial programme envisaged an interval of 24 hours clear between corps, but on representations from the General Staff these gaps were reduced to 8 hours. This just sufficed to make good the delays, which were due mainly to operating difficulties on the newly reopened section Lötzen–Bischdorf, where station lay-outs, signals and water points had been hastily repaired. The whole movement was completed to schedule, and the advance commenced on 28th September.

Road and rail communication had been deliberately neglected in South-West Poland; and of the two lines available, Sosnowice–Ivangorod and Tschenstochau–Warsaw, the former was to 5 feet gauge, and both were seriously damaged.[2] Operating difficulties—e.g., lack of telegraph lines, inadequate station lay-outs and derailments due to hasty conversion of gauge—were increased by irregular loading and slow discharge at railhead; nevertheless the railway service succeeded in meeting the most urgent demands.

(*e*) *The Disengagement and Concentration of the Ninth Army near Thorn.*—Simultaneously with the conversion of track and reconstruction of damaged works during the advance, measures were taken for their thorough demolition in the event of withdrawal. On 5th October the Ninth Army reached the Vistula opposite Ivangorod and, to cover the northern flank, demolitions were at once initiated embracing all the lateral lines in the area Lowitsch–Lodz. On 10th October an order was captured revealing the intention of the Russian Higher Command to envelop the German left wing, and pressure began to develop a few days later. On 18th October withdrawal from the immediate neighbour-

[1] L.K. = Linienkommandant, the military member of a Line Commission.

[2] The single line Ostrowo–Lodz was unusable owing to thorough demolition of the Warthe bridge.

hood of Warsaw began, and on 26th October the decision was taken to retire on Upper Silesia.

The systematic destruction of all communications in Western Poland, the first demolitions of the War on so extensive a scale, completely fulfilled their strategic object: the Russians had soon to halt for reorganization of their rear services and lost contact.

Meanwhile G.H.Q. *Ost* on 3rd November decided to reconstitute the Ninth Army in the area South-West of Thorn. Three cavalry divisions were on their way from the Western Front, two corps could be drawn from East Prussia, and two and a half from Upper Silesia. D.R. *Ost* had already begun the collection of empty stock in readiness; technical instructions were issued on the morning of 4th November, and on 6th November the move commenced—818 trains in all. On 11th November the Ninth Army was ready to undertake a fresh offensive against the flank of the Russian forces still making slow progress through the devastated area in South-West Poland.

It would be difficult to imagine a better example of strategic mobility compensating for inferiority in numbers. In the space of three months, from mid-August to mid-November, 2,480 troop trains were run over the East German system; and it is worth glancing back to note the time required to initiate these large-scale troop moves. The material dates are summarized below:—

Move.	*Leading Formation.*	*Warning.*	*Definite Orders to D.R.*	*Departure of First Train.*
To Gumbinnen.	XVII Corps.	"Some days earlier."	Morning 14/8.	Evening 14/8.
To Tannenberg.	3rd Reserve Division.	*Nil.*	9.30 p.m. 20/8.	Evening 21/8.
	I Corps.	,,	,,	11 a.m. 22/8.
To Silesia.	Guard Reserve Corps.	11/9.	15/9.	Midnight 16–17/9.
To Thorn from E. Prussia.	3rd Reserve Division and XXV Corps.	(Not known.)	Afternoon 3/11.	5/11.

To understand this swift response of a highly complex organization to the sudden demands of the General Staff we must turn to the technique of large-scale movement by rail.

The Higher Direction of Rail Movement.

Though demands upon the railway service are less variable and less urgent in peace than in war, civil practice has long appreciated the need for elasticity in working. Printed time-tables express a pious hope; they do not keep trains to time. Accidents will happen even on the best regulated railways, and from the very complexity of the advertised services, linked and interlinked by innumerable subtle connections, delay is cumulative—and expensive. To make the adjustments that will minimize delay control offices, like spiders at the centre of a web of telephone circuits, now operate in almost all areas of dense traffic.

But centralized train control has its limitations. It is dependent for success upon the perfection and security of its system of intercommunication, i.e., its reserved telephone circuits; and this security cannot be guaranteed in war. In consequence the elasticity essential to the railway service as an instrument of strategy must be achieved by some measure of decentralization.

The description which follows of the technique evolved in 1914–15 is based upon the particular experience of Austria-Hungary, as best illustrating the compulsion of events.

During the first few weeks of the War a central bureau, Z.T.L. (*Zentraltransportleitung*),[1] closely supervised all movement over the entire home system, where civil traffic was still restricted, as far as certain transfer points on the Lines of Communication whence Line Commissions within the zone of the armies assumed responsibility for onward movement.

This over-centralized movement control soon became impracticable, partly owing to the necessary resumption of a complex civil traffic and the growth of local military traffic, but still more owing to the action of the enemy and its reaction on the transportation system. First the diversion at short notice of large forces from the Balkan to the Russian front upset the movement programme elaborated in peace. Then the Russian successes in Eastern Galicia forced the abandonment of large sections of the Austro-Hungarian railway system and the transfer of two Line Commissions, from Lemberg and Stanislau, to safer points of vantage. For a time Z.T.L. attempted to control the whole north-eastern part of the railway system, which was soon thoroughly disorganized. Hundreds of thousands of refugees with their families, goods and even cattle, crowded into trains which made their way hap-

[1] This bureau was jointly staffed from the railway section of the General Staff and from the civil railway administration, with a special section to co-ordinate the distribution of locomotive power and rolling stock.

hazard, mingling with the stream of sick and wounded, West to Krakau and South across the Carpathian passes. Any semblance of centralized control was impossible, and Line Commissions were compelled to resort to routing traffic step by step, from operating district to district.

The flexibility of this method of working, confirmed during the protracted winter concentration in the Carpathians, led gradually to its general adoption for strategic movement. The essential principle is that an operating superintendent is not concerned with the ultimate origin or destination of the trains passing through his district, only with the place and time at which he will receive them and the direction in which they are to be despatched. The acceptance of this principle, with greater reluctance by the military than by the technical authorities, permitted a wide measure of decentralization.

Under the organization of August, 1914, the Director of Railways (*Chef des Feldeisenbahnwesens*) represented a branch of the Lines of Communication Inspectorate (*Etappenoberkommando*). This soon proved unsatisfactory; for close touch with the Operations Section of the General Staff, with cognizance of the strategic situation and plans, took precedence of maintenance duties. Consequently in the spring of 1915 the D.R.'s office was incorporated in the reorganized Higher Command (*A.O.K.*). Intimation of proposed movement would thus be given to the D.R., as a rule verbally, by the Operations Section. Often he could at once assess the feasibility of the proposals; in complex cases only after study by his section. The bases of calculation were the present location of corps, entrainment areas, destination, number of trains required, practical density over each route after allowance for other essential traffic, and journey time: hence timings for head and tail of corps. As a rule the Higher Command wished the movement to be executed as rapidly as possible.

Once the entrainment area, routes and density on each were agreed with the Operations Section the D.R. telephoned to his subordinates to make immediate preparations for the move, e.g., "IV Corps H.Q., Corps Tps. and 31 Div. of Second Army as 'Hannibal' from Lemberg area by 20 trains daily via Krakau–Wien–Graz, 32 Div. as 'Xerxes' by 10 trains daily via Debreczen–Buda Pest–Pragerhof, both to Laibach for Isonzo Army. Entrainment begins 10th May, infantry leading."

L.K. Lemberg at once secured from Second Army H.Q. a clear and definitive administrative instruction to serve as a basis for the movement programme. He had then to arrange the detailed entrainment programme, the necessary loading facilities and the provision of rolling stock. For this last he had probably to draw on the home system through Z.T.L., who started empty stock trains from all parts for the

Lemberg operating district without needing to know the location of units or the movement programme. As the entrainment programme took shape this stock was marshalled where convenient and worked forward as necessary to the entrainment stations.

From reserve areas and quiet sectors it was possible to regulate entrainment and departure to time-table; but where movement was susceptible to hostile interference it was found more practical to despatch trains as loaded to the nearest large station (entrainment regulating station), whence they were routed to regular schedules. Purely transit authorities learnt in advance only the code word, density, commencement of move, and the next onward authority. With the normal advice of each train due at transfer stations were given technical details such as necessary locomotive and train crew reliefs. L.K. responsible for detrainment received the full movement programme as well as advice of every train; he regulated detrainment in liaison with the Army H.Q., clearing empty stock as quickly as possible to avoid congestion.

A.O.K. usually manifested a close interest in the move. The D.R. received progress reports at 7 a.m. daily, so that each morning the C.G.S. was in possession of the latest information—position of leading trains, number despatched, number passed through each operating district, and formations already detrained. This close watch on movement also permitted in emergency the diversion of units by their movement serial numbers without loss of secrecy.

The value of these methods was soon proved to the hilt, for the spring of 1915 saw the entry of Italy into the War. The exploitation of interior lines in what was now a war on three fronts depended entirely upon the standard gauge railway system. The scale of movement is sufficiently indicated by the fact that during the three months May to July, 1915, 3,540 troop trains were run over the Austro-Hungarian system. This figure includes movement from and to Germany.

The existence of machinery for the rapid initiation of strategic moves by rail does not, however, imply that the wheels will always revolve without friction; and to approach a closer understanding of the technical aspect of movement during operations certain examples have been selected for study in detail.

Examples of Strategic Moves by Rail.

(*a*) *Gumbinnen to Tannenberg—Move of German I Corps* (see Plate V). —Gumbinnen was fought on 20th August. At 9.30 p.m. orders for disengagement were issued—I Corps to move by rail via Königsberg–Marienburg. This double line was not only the main artery of supply

for the Eighth Army, but was also severely congested by refugee traffic; for no plan had been prepared before the War to serve as a basis for the orderly evacuation of military stores and refugees from abandoned territory. Following the battle, panic scenes ensued; refugee trains were loaded and despatched as fast as empty stock could be found, and in no sort of order, while the sudden reversal of supply movement made matters worse. Time was needed to clear this congestion and, on technical advice, the initial orders of 21st August for the move of I Corps envisaged entrainment commencing at noon 24th August from Königsberg unless, as was hoped, empty rolling stock could be placed earlier at stations West from Wehlau; covering troops were to be furnished by the Königsberg garrison. The urgency of the strategic situation and the exhaustion of the troops, forcibly represented by the corps commander, led, however, to entrainment being advanced, and from stations as far East as Insterburg.

By 11 a.m. 22nd August the move had begun; but when eight trains had been despatched it was suspended for twelve hours till 1 p.m. 23rd August, owing to delays in the arrival of empty stock. This was not for lack of rolling stock—for since 17th August the D.R. *Ost* had been collecting a reserve round Danzig—but owing to the difficulty of working it forward over the congested main line. And when movement was resumed from Norkitten and West thereof, owing to the alarmist reports of Russian progress entrainment ceased prematurely—at Norkitten late on 23rd August,[1] at Wehlay during the night 24th–25th August, and at Tapiau 1 p.m. 25th August. Thereafter despatches were from Königsberg only, the last trains leaving on 26th August.

The task of the technical service was none the easier for counter-orders as to the destination of the I Corps. Initially it was the Graudenz area, via Dirschau–Laskowitz; this was changed on 22nd August to Gosslershausen and Bischofswerder for the two divisions of the Corps, with rear services to Laskowitz–Marienwerder. At 7.45 p.m. the same day the two L.Ks. concerned, Königsberg and Danzig, received orders direct from Ludendorff at O.H.L. to detrain I Corps in the neighbourhood of Deutsch Eylau.

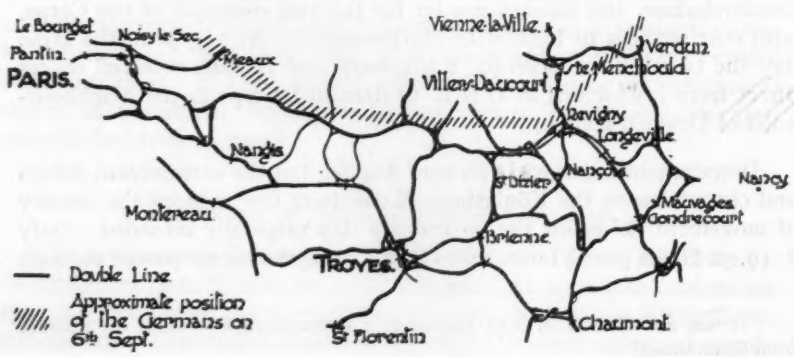
Detrainment began early on 23rd August; but the entrainment delays and congestion on the Königsberg–Marienburg line reduced the density of movement far below the 60 trains a day originally intended. Only 8, 19, 32 trains per 24 hours up to 8.30 a.m. 25th August passed through

[1] It was not till late on 23rd August that Rennenkempf resumed his advance from Gumbinnen.

Marienburg; and Ludendorff ordered the move to be accelerated—without explaining how. In this emergency L.K. Königsberg resorted to one-way traffic over the single line Kobbelbude–Wormditt–Osterode, and with an increase of running speed. During 25th and 26th August 39 trains in some 30 hours were diverted by this route, permitting, with 93 trains in all through Marienburg, completion of the whole move on 26th August. At the same time detrainment was pushed forward to Montowo, Rybno and even to Tautschken, less than 4 miles from the nearest Russian troops.

(*b*) *The Marne—Move of French IV Corps* (see Plate VI).—The French organization for strategic movement by rail differed slightly from the German, though in principle it was the same. The D.R. (*Directeur des Chemins de Fer*) outlined the route, density, points of entrainment and detrainment, date and time to commence. The Line Commission (*Commission de Réseau*—for the whole Est system, and therefore with a rather larger sphere of responsibility than the German L.Ks.) issued the necessary technical instructions, e.g., as to additional operating personnel on the lines affected, provision of locomotive power, intermediate timings and diversion of other traffic. A *Commission régulatrice d'embarquement*, appointed *ad hoc*, in touch with headquarters of the formation moving, arranged the details of entrainment and despatch; while a similar *C.R. de débarquement* regulated the detrainment. Ninety standard type trains were held in readiness for troop movement at various points on the Est system from the 14th day of mobilization. Less than 24 hours' notice was usual. For instance, the *Commission de Réseau* might receive warning from G.Q.G. at 9 p.m.,

Plate VI. THE MARNE



and definite orders at 11.30 p.m. : departure of the first train would be timed for 5 p.m. the following day.

Strategic troop moves had begun as early as 16th August with XVIII Corps, by 48 trains daily from Toul to Maubeuge ; and movement from the right to the left wing continued during the last days of August, though with increasing difficulty on account of the German advance.

The IV Corps, destined for Maunoury's Sixth Army North-East of Paris, was to be disengaged in the Ste. Menehould region while in retreat : its route was to be St. Dizier–Troyes by 32 trains daily with priority over all other traffic. Entrainment of the fighting troops, begun at Ste. Menehould on 2nd September, continued successively at stations further South, ending at Revigny on 4th September—74 trains in all. These were despatched concurrently with the process of evacuating railway personnel and stores, and with the demolition of technical installations. Some trains actually left after rear parties had withdrawn, and constant modifications of the programme were unavoidable. Thirty-five trains of corps services (*parcs et convois*) followed from the St. Dizier-Chaumont area, but these moved by a more westerly route.

The leading trains arrived to time, and 8th Division was in action near Meaux on 7th September, on the left of the B.E.F. ; 7th Division following was delayed by congestion *en route* due to retreating troops and refugees, as well as by a premature evacuation of Nangis, involving a detour via Montereau for several trains ; but it was in line on 8th September.

This lateral move during the retreat was executed under great difficulties ; technically it would have been easier to draw a corps from the right wing behind a stable front. During this period the Higher Command, impressed by the exact execution of the initial concentration, was inclined to expect rather too much of rail movement under unfavourable conditions, e.g., over congested lines near a moving front. We have seen the same happening in East Prussia.

The move also illustrated an important aspect of " manœuvre in retreat." The French possessed all the strategic flexibility which an intact railway system affords, whereas, owing to the damaged lines in North-East France, the Germans were at this period virtually deprived of all lateral communication.

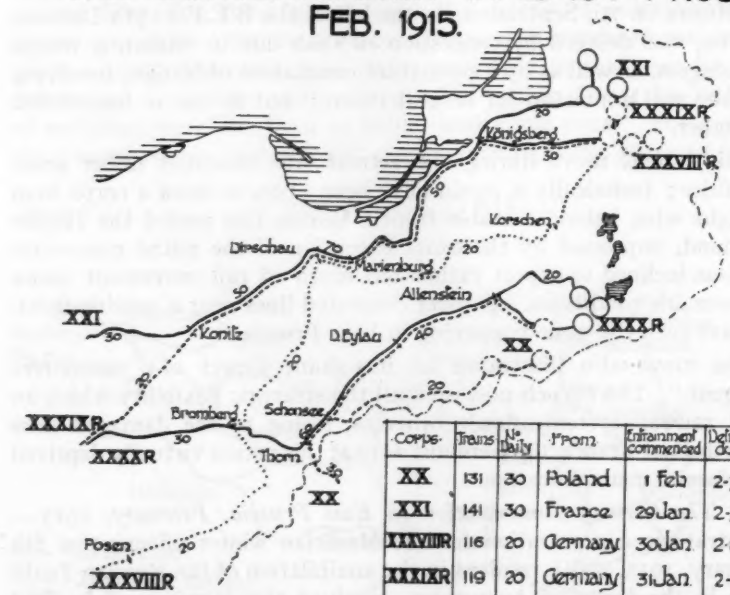
(*c*) *The German Concentration in East Prussia, February*, 1915.—The strategic concentration for the Masurian winter offensive of 8th February, 1915, which resulted in the annihilation of the Russian Tenth Army in the forest of Augustowo, involved the detrainment in East Prussia of no less than five corps (608 trains) within a week. Plate VII

is self-explanatory and reveals the strategic plan—two masses on either wing, North and South of the Lakes, to achieve double envelopment, the two active Corps (XX and XXI) being on the outer flanks.

Preliminary instructions in regard to entrainment of the new reserve corps, whose destination was not yet known, were issued by the D.R. at O.H.L. on 9th January: instructions for movement of XXI Corps from La Fère as far as Trier on 25th January: and instructions to home system L.Ks. *re* further movement of this Corps and of the three reserve corps from Germany on 26th January. Detrainment and the move of XX Corps from Poland were regulated by D.R. *Ost*, who issued his instructions on 28th January. L.Ks. were advised that time-keeping must not be prejudiced by any regard for civil traffic. To minimize comment the meagre civil time-table was maintained in operation East of the Vistula: but in Germany proper civil traffic was largely suspended, and all stations at which troop trains stopped were closed to the public. The dislocation of maintenance and other military traffic was necessarily severe; and it was prolonged by the movement of some 140 trains of

Plate VII.

THE CONCENTRATION IN EAST PRUSSIA
FEB. 1915.



Corps	Trains	No. Daily	From	Entrainment commenced	Detrained during
XX	131	30	Poland	1 Feb	2-7 Feb
XXI	141	30	France	29 Jan	2-7 Feb
XXXVIIIR	116	20	Germany	30 Jan	2-8 Feb
XXXIXR	119	20	Germany	31 Jan	2-8 Feb
XXXXR	101	30	Germany	31 Jan	2-6 Feb

heavy artillery, line of communication and army troops at the heels of the main concentration.

Accidents occurred on four out of the five routes, but only the XXI and XX Corps were appreciably delayed. At 8 p.m. 3rd February a collision occurred West of Konitz, blocking both lines. L.K. Danzig, reckoning on a delay of only two hours, considered the diversion of traffic unnecessary. But to clear the debris took five hours, and the repercussions were felt even in France. L.K. Saarbrücken was compelled to suspend entrainment during the morning of 4th February, while the Sedan district experienced delays up to thirteen hours through the blocking back of traffic.

The XX Corps came from Poland. To reach the required density of 30 trains a day one-way traffic was instituted on the single-line circuit Ostrowo–Koluschki–Skjernewize–Thorn. Three mishaps occurred—an engine failure ; the derailment of an empty stock train near Lodz ; and the release of a supply train from Thorn in the wrong direction. In consequence the troop trains left Poland 10–12 hours behind schedule.

Having regard to the limited rail resources in East Prussia, this concentration might well serve as a model of its kind ; but consider for a moment the possible effects of air bombing upon the two bottlenecks, Dirschau–Marienburg with 70, and Thorn–Schönsee, with 60 trains a day.

Summary.

It is now time to summarize our deductions from the experiences of 1914–15. Of the characteristics which distinguish movement during operations from the initial concentration, the short notice, the intrusion of unexpected purely military considerations such as exhaustion of the troops, the frequency of lateral cross-movement and of a rapidly changing strategic situation—these have been sufficiently illustrated. What is less easy to understand is the purely technical aspect, in particular the limitations imposed by the material and how far they can be overcome in emergency.

In the first place, line capacity is no longer easily calculable ; of the routes available some more, some less, will be taking other traffic that cannot be curtailed save at a cost—maintenance traffic, swelling rapidly as the war progresses ; drafts ; ambulance traffic ; prisoners of war ; salvage and refugee traffic, apt to develop at the most awkward moments ; troop moves already under way ; empty rolling-stock movement ; technical maintenance traffic, such as ballast and locomotive coal trains ; and a heavy civil traffic : for the economic life of the country and the production of war material must be maintained.

Still more drastically than by other traffic is line capacity reduced by damage. A line that has been systematically damaged, whether by ourselves or by the enemy, will be unfit for large-scale strategic movement long after hasty repairs have permitted its reopening for urgent supply traffic. For instance, during the German withdrawal from before Warsaw [1] efforts were made from 29th October to rail troops from Petrikau, but the move was cancelled after the despatch of six trains owing to the serious delays in working over the repaired line.

The trouble is not only damage to track and bridges, but the destruction of technical equipment, e.g., signal apparatus, telegraph lines and water supply installations. In consequence a war of movement tends to create a zone of permanently reduced capacity, as happened in Poland and Galicia. Not until the stabilization of the Eastern front in September, 1915, was systematic repair and new construction possible behind the Austro-German front; and many months elapsed before even the bare maintenance needs of the armies could be adequately met. It is important also to remember that the repair of damaged lines or measures to increase capacity will temporarily reduce the existing capacity owing to occupation of the track for work and the movement of trains of material.

Various expedients have been employed to increase line capacity in emergency, such as increase of running speed or coupled trains.[2] On several occasions the Germans resorted with success to one-way traffic over single lines; this presupposes of course another route for the movement of the empty stock. In Austria-Hungary permissive block [3] for troop movement was introduced in December, 1914, to meet the critical situation in the Carpathians; but though this increased the

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[1] See p. 367.

[2] Two examples of exceptional density of traffic may be quoted:

(i) In October, 1914, during "the Race to the Sea," the Creil–Amiens double line of the Nord system carried, for a short period, up to 135 trains each way daily as compared with a maximum capacity of 85 envisaged in peace.

(ii) Following the break-through at Gorlice-Tarnow in May, 1915, on the Eastern Front the double line Krakau–Tarnow–Jaroslau became the main artery for supply and troop movement. On 6th June the density of traffic reached a maximum of 82 east-bound and 84 west-bound 100-axle trains, an amazing achievement, as single-line working was necessary over repaired bridges at four separate points. Scheduled timings were impracticable; every third hour coupled trains took their place in the eastward stream of traffic, while empty stock was worked back in 200-axle trains over the single-line bridges.

[3] The normal system of absolute block guarantees a space interval between trains, and thereby their safety. Under permissive block trains may follow each other into section if the driver is warned. It is inapplicable to two-way traffic over single lines.

density over double-line stretches, it reduced the efficiency of the system as a whole, disorganizing the turn-round of locomotives and rolling stock and, above all, causing intolerable congestion on the terminal sections.

For, no less than line capacity, entrainment and detrainment facilities set a limit to the density of movement. This the Austrians found to their cost in the Carpathians. The troops had to be detrained at small stations cramped in narrow valleys or on hillsides with no room for expansion, where they competed with maintenance traffic for the few sidings and with the Line of Communication services for the scanty accommodation. To clear platforms and station yards rapidly was impossible for want of store depots and good roads, so that irregular working with all its evil consequences became the rule.

Of course in a sudden emergency measures may be taken which would be quite impracticable if prolonged. For instance, at the crisis of the Marne the XV Corps, moving by march route from Nancy, was enabled to intervene near Revigny on 8th September by railing the infantry of its two marching columns over the last 25–30 miles from Gondrecourt and Mauvages (see Plate VI). From Gondrecourt station alone 10 trains were despatched between 5 and 8 p.m. of 7th September, eight (two at a time) loading personnel on the running lines, and two (in succession) horses and vehicles at the military platform. Detrainment took place at Longeville and Nançois ; while all night the artillery and transport rolled on through Gondrecourt.

The fact is that emergency measures hinge entirely upon the particular circumstances. An increased density of traffic will lead only to congestion if the facilities ahead are inadequate to cope with it. In any case emergency measures create abnormal conditions—an irregular distribution of rolling stock, exhaustion of operating personnel, etc. ; and time is always needed for recovery.

It is to avoid abnormal working that spare paths and safety margins of time appear in every estimate and movement programme, since minor mishaps are unavoidable and delays accumulate. But interruption, whether by enemy action or by an accident, may be a matter of more than a few hours ; and it is important to understand the nature of such flexibility as the technical instrument possesses. On terminal sections, as we have seen, entrainment or detrainment stations can be shifted at short notice. But elsewhere, unless traffic can be diverted over parallel routes, interruption will soon necessitate suspension of the move at source. Technical flexibility is, in short, far greater laterally than from front to rear : flow can be diverted more easily than it can be dammed. Hence the technical rigidity of a heavy concentration

programme, using all routes simultaneously, as compared with smaller troop moves possessing some lateral elasticity.

Lastly, what is the price of strategic freedom of action? Idle reserves of empty rolling stock, lines and stations used to less than full capacity; or else a readiness to cancel the bulk of normal traffic at immediate notice. The administrative services have a tendency to load to maximum capacity, while the General Staff demands elasticity; and these two inevitably conflict. To think in terms solely of supply is dangerous: paralysis is apt to develop from congestion.

The Influence of Modern Conditions.

Throughout 1914–15 the railways were virtually immune from hostile air attack. They will no longer operate under the same conditions, although the prophets sound no certain note as to the scale of such attack. The processes of mobilization and of strategic concentration; the maintenance of the armies in the field; more, the whole economic activity of the nation at war, all depend upon the railways: and railways are vulnerable. The danger lies not so much in material damage as in chronic dislocation of a very complex organism.

But reasons have been given for anticipating a decrease in the density of urgent traffic as compared with 1914: and dangers invoke counter-preparation. The guess may be hazarded that the protective measures necessary to the maintenance of industrial production and of the civil morale, and therefore to the conduct of war, will be sufficient to guarantee the transportation system against paralysis, though not against local interruption.

Study of the 1914 concentrations, so vast and so precise, led us to the conclusion that more flexible methods are essential, both to meet this risk of interference and to preserve a greater liberty of manœuvre. The mobile warfare of 1914–15 of necessity bred such methods, and from them future practice is bound to be derived. Technically, strategic concentration and movement during operations present no insoluble problem, but the instrument must be used with understanding. Technical flexibility must have its counterpart in a certain breadth in military demands. For instance, during a move lasting several days, routes and detrainment areas cannot, or should not, be exactly predetermined: the conditions are too unstable, and some latitude is essential if the railway operating department is to maintain the flow of movement.

But will approximate delivery of the goods satisfy the General Staff? It is suggested that the increase in mechanical transport since

1914 provides the answer. It matters little whether mechanized units, or the mechanized transport of other units, are detrained 20 or even 50 miles from their true destination; the difference is at most a matter of a few hours. In consequence detrainment, and entrainment, areas can have greater depth than in 1914. This will not only multiply the number of possible detrainment stations, but may even increase the number of routes available, materially simplifying the task of the transportation service.

Mechanical transport has, however, a wider significance. The range of our so-called tactical moves is now far greater than the old two-days' march of horse transport. For distances up to 150 miles mechanical transport, excluding tracked vehicles, will normally move by road. This will permit at need an enormous reduction of rail movement in areas subject to hostile bombing. Even long-distance movement is affected, for circumstances may justify the detrainment of mechanical transport outside effective bombing range to complete the move on wheels. Roads are in fact an indispensable supplement to railways, both as a relief and as a reserve, for the carriage of troops no less than of supplies. The problem of movement must therefore be regarded as a whole, or else that elasticity which modern conditions demand will be lacking.

It is not within the scope of this essay to pursue the problem further; the object has been to assemble the facts of experience with just sufficient comment to indicate the field, and need, for thought. What is important is not so much technical knowledge as a certain technical wisdom in commands and staffs. At the same time the transportation services must be conscious of the compelling strategic background and free from any departmental rigidity. Only then can their relations rest upon a firm basis of mutual understanding and trust.

APPENDIX D.

Troop Moves on the German Eastern Front, 1914.

Formation.	No. of Trains.	From Area	Entraining	Route.[1]	To Area	Detraining
Troop Moves prior to Gumbinnen.						
3rd Reserve Division, etc.	56	Bromberg–Gnesen.	11–13/8	A & B	Lötzen–Korschen.	12–14/8
XVII Corps.	139	Deutsch Eylau–Soldau.	14–18/8	A & B	Insterburg.	15–18/8
Heavy Artillery, etc.	30	Königsberg.	14–18/8	—	Insterburg.	14–18/8
	225					

[1] Route A—Korschen, Deutsch Eylau, Thorn, Gnesen, Ostrowo, Kreuzburg.
B—Königsberg, Marienburg, Schneidemühl, Posen, Breslau, Oppeln.

Formation.	No. of Trains.	From Area	Entraining	Route.[1]	To Area	Detraining
The Disengagement from Gumbinnen and Concentration for Tannenberg.						
3rd Reserve Division, etc.	60	Nordenburg–Lötzen.	21–23/8	A	Allenstein.	22–23/8
I Corps.	132	Insterburg–Königsberg.	22–26/8	B	Deutsch Eylau.	23–26/8
Army troops.	13	Thorn.	22–24/8	—	Strasburg.	23–24/8
Landwehr Division, Goltz.	26	(Danish frontier.)	25–26/8	A	Osterode.	27–28/8
	231					
Reinforcement of Eighth Army for the Masurian Lakes.						
Guard Reserve Corps.	142	(Western Front.)	30/8–3/9	B	Braunsberg.	2–5/9
XI Corps.	134		30/8–3/9	A	Allenstein–Osterode.	2–6/9
8th Cavalry Division.	33		31/8	Posen–Bromberg.	Mohrungen–Riesenburg.	3–4/9
Heavy Artillery, etc.	76	Thorn, Posen, Soldau.	4–10/9	B	Königsberg.	5–10/9 [2]
Landwehr Division, Goltz.	32	Soldau.	7–8/9	A	Sensburg.	8–9/9
	417					
Concentration of the Ninth Army in Upper Silesia.						
Guard Reserve, XI Corps, etc.	342	Wehlau–Königsberg.	17–29/9	B	Krakau–Gleiwitz.	18/9–1/10
XX, XVII Corps, 8th Cavalry Division, etc.	423	Lötzen–Korschen (part Deutsch Eylau).	17–30/9	A	Tschenstochau (part Ostrowo).	18/9–2/10
	765					
Concentration for Offensive through N.W. Poland to Lodz.						
(*a*) *From Upper Silesia.*						
XVII Corps, 3rd Guard Reserve Division, etc.	237	Kreuzburg and Tarnowitz.	6–12/11	A	Wreschen and Hohensalza.	7–13/11
XX Corps, etc.	230	Kattowitz.	6–12/11	B	Gnesen–Hohensalza.	7–13/11
(*b*) *From East Prussia.*						
I Reserve Corps.	113	Gumbinnen.	5–11/11	B	Thorn.	6–12/11
XXV Reserve Corps, etc.	138	Lötzen.	5–10/11	A	Thorn.	6–11/11
(*c*) *From the Western Front.*						
5th, 6th, 9th Cavalry Divisions.	100	(Western front.)	30/10–6/11	Schneidemühl and Posen.	Wreschen and Hohensalza.	1–8/11
	818					

[1] Route A—Korschen, Deutsch Eylau, Thorn, Gnesen, Ostrowo, Kreuzburg.
" B—Königsberg, Marienburg, Schneidemühl, Posen, Breslau, Oppeln.

[2] Of these, part (24 trains) were sent back 11–12/9 to Soldau.

IRAQ

By MAJOR-GENERAL H. ROWAN-ROBINSON, C.B., C.M.G., D.S.O.

On Wednesday, 12th December, 1934.

GEBERAL SIR ROBERT WHIGHAM, G.C.B., K.C.M.G., D.S.O., in the Chair.

THE CHAIRMAN, in introducing the Lecturer, stated that General Rowan-Robinson had served for four and a half years as Inspector-General of the Iraq Army and had been in Iraq throughout the period when independence was granted to that State.

LECTURE.

I PROPOSE to begin by reading a few extracts from the Treaty between Great Britain and Iraq that was made the basis of the independence of that State:

ARTICLE 1.

". . . There shall be a close alliance and full and frank consultation . . . in all matters of foreign policy which may affect their common interests."

ARTICLE 3.

Deals with endeavours to settle disputes by peaceful means.

ARTICLE 4.

". . . Should either of the High Contracting Parties become engaged in War the other High Contracting Party will, subject always to Article 9 (which deals with our obligations under the Covenant of the League and the Kellogg Pact) immediately come to his aid in the capacity of an Ally. In the event of an imminent menace of War they will immediately concert together the necessary measures of defence. The aid of H.M. the King of Iraq in the event of war or the imminent menace of war will consist in furnishing His Britannic Majesty in Iraq Territory all facilities and assistance in his power, including the use of railways, rivers, ports, aerodromes and means of communication."

These articles, I submit, constitute a serious commitment on the side of Great Britain. Indeed, apart from our obligations under the Locarno Pact and the Covenant of the League of Nations, it is the

most important of our foreign commitments. And it differs from the other commitments in being quite explicit. It admits in fact of only one interpretation. It is, therefore, just as well that we should know something of Iraq and its environment.

POLITICAL.

First of all I will touch very briefly on the political side. It is now exactly four hundred years since the Turk Sultan Suleiman conquered Mesopotamia. Thus before our wresting the country from the Turks the inhabitants had suffered from nearly four centuries of alien rule and misrule. The influence exercised in the succeeding years on their character by this long domination must be borne in mind. It was hardly to be expected that they would immediately display the requisite qualities for self-government—judgment, initiative, and the sense of responsibility. They, however, did not in the least realize the disabilities due to this repression and to lack of experience. The political history of the fourteen years following the Armistice consisted, therefore, in a continual struggle between the Iraqi desire for immediate independence and the reluctance of the British administrator to relinquish control until he felt sure that the Iraqi was qualified to take his place without injury to the State.

The Iraqi had strong grounds for his demands for early independence. When Sir Stanley Maude, after a series of hard-fought battles, reached Baghdad, he proclaimed that the British Army came not as conquerors but as liberators. The British Government confirmed that view. It was also confirmed by the agreement with King Husein, by the Anglo-French declaration of 1918, which promised liberation and national governments to the Arab peoples, and by President Wilson's Fourteen Points.

For our part, as we had advanced into Mesopotamia we had taken over the civil control of the country behind the Army, and by the time of the Armistice we had 3,000 British and Indian officials administering the country. Such administration was very necessary, and it was very efficient. It showed, however, no signs of termination, and the Iraqi, with the impatience of the Oriental, who thinks that Constitutions can grow in a night, was chafing at the delay. A tug-of-war was also in process between the Home Government and the Man on the Spot, the former urging the immediate formation of some form of National Government, and the latter denying its possibility. Out of this conflict grew the Arab Rebellion of 1919 and 1920.

After the rebellion was crushed we accepted the Mandate from the League, by the terms of which we agreed to act as trustee for Iraq,

provisionally recognizing her existence as an independent nation subject to the condition that we should render advice and assistance until such time as she was judged able to stand alone. We at once set up a Constitution, two Houses of Parliament much on our model and a Constitutional Monarch. The Iraqi, however, suspected that the word " Mandate " was camouflage for Protectorate and hated the thought of it ; and had we assumed any sort of definite control short of complete control would have probably rebelled again. Complete control would have entailed the continued occupation of Iraq by a large British garrison, to which policy the British public were unalterably opposed. It was therefore decided, though we could not evade our mandatory responsibility to the League, to substitute for the mandate a treaty in which, in lieu of control by the Mandatory, a number of obligations were accepted by the junior partner in the alliance.

In spite of immense difficulties due to the vanity and inexperience of politicians, to external and internal insecurity and to financial troubles, the treaty and the constitution both worked after a fashion and a slow but steady advance was made in every department of State. Insistently, however, came the cry for the removal of all control and for real independence. The successive High Commissioners were faced with a difficult problem : to create, improve, encourage ; to aim at progress and at the same time to curb the excessive national self-confidence which the signs of progress induced. Eventually it was decided in the time of Sir Gilbert Clayton to support the candidature of Iraq for admission to the League in 1932 ; and, as mandatory responsibilities would automatically terminate upon the admission of Iraq to the League, to define future relations between the two countries by the conclusion of a new treaty. That treaty, which was signed in 1930, is the one from which I read extracts, and it guides our common relations to-day. Other conditions included in it are that our High Commissioner is replaced by an Ambassador, that air bases are granted to the Royal Air Force at Basra and West of the Euphrates, the move to the new stations taking place not later than 1937.

MILITARY HISTORY.

I will now turn to the military side. In 1914, when our forces first invaded Mesopotamia, there was a consensus of military opinion that it would be sound to hold the area about Basra to protect our interests in the Persian Gulf and in the Anglo-Persian oil fields, but quite unsound to make any advance northwards. It was held that such a move would absorb large forces, thus making a considerable diversion from the main theatre ; that it would merely push the enemy back along his

line of communication and offer no decisive results. Moreover, if we occupied the country we should have it on our hands after the War. Our Army would probably then be smaller than ever, and it would have to guard a further 1,700 miles of frontier, a frontier not like most of those in the British Empire, surrounded by seas, deserts or great mountains, but a fairly open frontier. Events, however, drove us to occupy the country, and during the War it absorbed some 890,000 troops. In November, 1918, our ration strength was 414,000, of which 112,000 were fighting troops. After the armistice numbers were steadily reduced until the middle of 1919, when the Arab Rebellion broke out, at which time they stood at 60,000, of whom 26,000 were fighting troops. This figure did not allow a sufficient margin of safety in a country of great distances and poor communications, and it had to be increased to 43,000 before the very serious danger was averted and the insurrection quelled. The public outcry against the expense incurred, which amounted to nearly £100,000,000, and generally to the cost of maintenance of an army of occupation, combined with a natural desire on the part of the Iraqis to undertake their own ground defence, resulted in the adoption of a scheme of Air Control which was to cost the British Exchequer only four million pounds annually as opposed to a scheme for Army control priced at ten millions. The situation was ripe for the experiment, as the more hostile elements of the population had received a salutary lesson during the suppression of the insurrection and were, therefore, unlikely to rebel again in the near future. Moreover, the establishment of a National Government had removed a primary cause of discontent. In 1922, when the Air Ministry assumed control, there were, besides 8 air squadrons, British military forces amounting to 1 infantry brigade, 4 armoured car companies and 1 pack battery. There were also some 15,000 Iraqi troops forming the Army, the Levies and the Police. The Levies, who were some 5,000 strong, were then the only well-trained and well-equipped troops, being in British pay and led by British officers. During 1922 both the Turks and the Kurds had been giving trouble, but they were both defeated by the joint action of the Royal Air Force and the Army, and the consequent clearance of the atmosphere seemed to justify the withdrawal from Iraq of the remaining units of the British Army and a reduction of the air forces. In spite of various rebellions in Kurdistan and some raiding across the desert, this reduction of the air forces was continued until there were only 4 air squadrons in Iraq plus a flying-boat squadron in the Persian Gulf, based on Basra. From £20,000,000, which the army had cost in 1921, occupation costs had been reduced to £1,500,000. During this period, however, the Iraqi Army had been growing in strength and efficiency, and thus actually much of the

Diabekr.
TURKEY
Jezireh
Nisibin
Julamerk
Zakho
Amadia
To Tabriz
Dohuk
Tel Afar
Mosul
Greater Zab R.
Rowanduz.
Erbil
Koi Sanjac
Rania
Zab. R
Lesser
Penjwin
Kirkuk
Sulaimania
Khaniqin
Kermanshah
Hamadan
Kifri
Pipe Line
To Tripoli
To Haifa
Haditha
Samarra
Baquba
Mandali
Fellujah
Ramadi
BAGHDAD
Habbaniya Lake
Hindyeh
Kerbela
Hillah
Kut
Dizful
Nejef
Diwaniya
Amara
Ur
Hamar Lake
Qurna
Basra
Fao
PERSIAN GULF
Koweit
SAUDIA
SYRIA
PERSIA
Scale of Miles
10 0 50 100 150 200

financial burden of defence was being transferred from the British to the Iraqi exchequer. The Levies, which had been used for the protection of aerodromes and for minor expeditions on the frontier in association with the Royal Air Force, were also gradually reduced as the Iraqi army increased, till they totalled only some 1,200, at about which strength they now stand. The Iraqi army, trained and equipped on modern lines, had by 1933 expanded to 12 battalions, with 5 batteries, 2 cavalry regiments, and a motor machine-gun company, which included armoured cars, plus an air force of some 2 squadrons.

To turn now to the campaigns fought in this period. In 1919 we swept through both Northern and Southern Kurdistan. We suffered two minor disasters in the process, but General Fraser defeated and captured the redoubtable Kurdish chieftain Sheikh Mahmud. In 1922 Turkish detachments had penetrated to Rowanduz and Koi Sanjak, some 70 miles within the Iraqi borders; and, had the Turks been free in other respects, they would almost certainly have pushed forward large formations and captured Mosul. Fortunately they were a little anxious about both France and Italy, and were, therefore, rather afraid to undertake a major operation. At this time Sheikh Mahmud, who had been exiled for 3 years, then reinstated by us as Governor of Kurdistan, broke out again and gave considerable trouble. As he lay near the line of communication of any force operating towards Koi Sanjak, Sir John Salmond decided to concentrate first against him, while pinning the Turks by continuous air-action. He himself, working from Baghdad by air, was able to control both operations personally and to co-ordinate the movements of the two columns under Berkeley Vincent and Dobbin, which dealt first with the sheikh and then drove out the Turks. This campaign furnished an interesting illustration of command from the air effectively exercised under difficult conditions. It is a method of command of which we are likely to see a good deal more in the future.

From 1923 to 1927 Sheikh Mahmud continued to give trouble. He was defeated in 1927 by a clever coup. While the Iraqi army was marching to attack him frontally a small column of Levies started 24 hours later by a shorter route to attack him in rear. In order to keep the latter movement secret, supplies for the Levies, which were normally obtained from a contractor, were brought up by air, with the result that the Sheikh was completely surprised, defeated and forced to agree to reside in Persia.

Later on in the year there was a good deal of raiding into Iraqi territory by the desert tribes on the South-West. Forts had to be built in the desert about a hundred miles apart; these formed centres for the

activities of detached infantry and armoured car sections, they denied the principal water-bearing areas to raiders, they furnished useful centres of information, and they were supplied by air. Three bombing squadrons, 6 sections of armoured cars, and a motor machine-gun company were employed in these operations, while the Iraqi army guarded the main approaches. The operations were not very successful, partly because of the great lengths of frontier to be watched—450 miles—and the consequent difficulty of obtaining quick news of a successful raid, partly because the raiding parties were small, difficult to locate and, when found, dispersed at once, leaving their loot to be picked up again later. Had the enemy advanced in larger force the arrangements made would probably have proved more effective. After a time the marauders raided into Nejd, when Ibn Sa'ud took a hand and defeated them. They then fell back into Koweit and surrendered to British forces.

In 1930 Sheikh Mahmud broke out again from Persia. The operations against him and those a year later against Sheikh Ahmad of Barzan have been already described in this JOURNAL, so I will say nothing about them except that they were brought to a successful conclusion largely owing to the gallantry of the Royal Air Force and to the excellent co-operation of ground and air forces.

It will have been seen from this brief account that Iraq has proved an excellent training ground for air squadrons, especially in operations in support of the civil administration; and that it has also proved a great field of activity for young Army officers of an adventurous disposition, serving either with the Levies or the Iraqi army. When I was young there were many such fields, but the intervening period has been one of consolidation of our territories, and they are now rare. I will now pass to a description of the country.

GEOGRAPHY.

Iraq is the land of the two rivers, which have formed the principal source of irrigation and chief means of communication down the ages. The Tigris is navigable throughout Iraq by boats of light draught, though only with difficulty in the late summer. The Euphrates is navigable only by stretches. That was why Babylon was evacuated and Seleucia, then Ctesiphon, and finally Baghdad, all on the Tigris, selected as capitals. Both rivers are liable to dangerous floods, which cause wide inundations and a sad waste of valuable water. Prior to the War, Sir William Willcox produced a scheme for the Turkish Government for the harnessing of the waters. Only one large element of his plan was, however, completed by the Turks, the Hindyah barrage,

which is a fine piece of work and which controls the canal service of the middle Euphrates, incidentally placing power in the hands of the Government to restrain rebellious activities on the part of tribes in that area. Two further portions of the scheme are shortly to be undertaken : the first the collection of the flood waters of the Euphrates into a great depression near Fallujah and their gradual release thence for irrigation ; and the second the Hai barrage, near Kut, the Hai being that *rara avis* a secondary river that flows out of a main river, the latter thus being the tributary. Wherever there is water in Iraq crops, dates, vegetables, fruit and flowers can be grown, all in great variety. The Iraqi, however, suffers from two disabilities in this connection. In the first place he is a careless cultivator and his corn is consequently dirty, and in the second place his exports have a long way to travel—some from Northern Iraq to Basra, and thence through the Suez Canal to Europe.

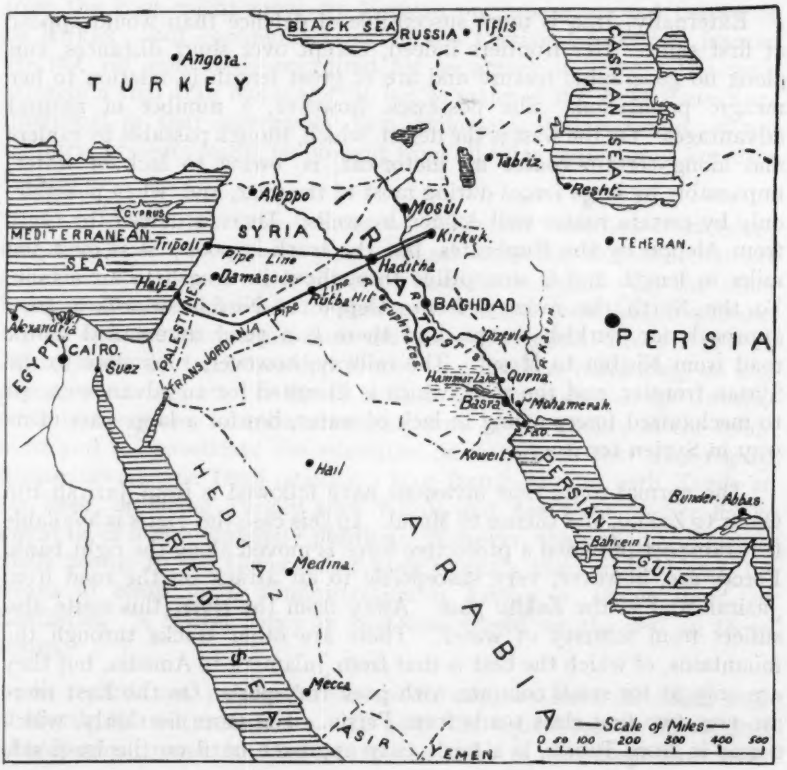
Oil is the other main source of riches to Iraq. It is found in large quantities in the Khaniqin area, in still greater quantity in the Kirkuk area, and prospecting with prospects is under way to the west of the Tigris south of Mosul. The oil at Khaniqin has long been sealed except for a single well, from which the turn of a screw ⅜ of a circle provides all the requirements of Iraq, including railways and hundreds of oil-driven irrigation pumps. In the Kirkuk area the chief well is supposed to be capable of yielding a million tons of oil yearly. A pipe line has been constructed from Kirkuk across the Tigris and Euphrates, bifurcating at Haditha, terminating at Tripoli for the French, and at Haifa for us. The first oil reached our terminus at Haifa, which is now a first-class harbour, in October last. The double pipe-line is, of course, expensive, but both French and British were determined to possess an exit under their respective controls for strategic reasons. Strategically, however, an exit at Haifa is of no great value to us, because tankers from there might still have to run the gauntlet in the Mediterranean.

The inhabitants muster some 3,250,000, of which roughly 1,250,000 are Shiah Moslems, and 1,000,000 Sunni Moslems, the minorities consisting of Kurds (500,000), Jews, Chaldeans, Assyrians, Devil worshippers and followers of John the Baptist. The Shiahs, who embody a large proportion of the fighting tribes of the Middle Euphrates, are thus in the majority. Political control, however, is vested in the hands of the Sunnis, to which sect most of the educated classes belong—the effendis of the big towns. The obvious dangers of such a state of affairs were for long tided over as much by the experience and political skill of King Faisal as by the fact that he was a member of the holy Hashimi family.

Now that he is dead it is quite possible that the Shiahs, unless they can attain more power, will cause trouble on the Middle Euphrates.

The railways Basra to Baghdad and Baghdad to Kirkuk were built by us during the War. A short stretch from Baghdad northwards towards Mosul was built before the War and was to form the Baghdad end of the great Berlin–Baghdad railway. There is some talk of connecting it up with Nisibin, at which point travellers from Europe now detrain to continue their journey by car to Mosul and Kirkuk.

The road policy of the Iraqi Government has, for a relatively poor country, been most progressive. Roads through the plains, though provided with bridges and culverts, are for the most part unmetalled, but are nevertheless always passable except in the rare cases of heavy rains, when traffic on them comes to a sudden standstill. Through the hills, partly to develop trade and partly to bring recalcitrant tribes under control, many excellent metalled roads have been built. Large



numbers of motor-cars and lorries, mainly of American brands, can be seen everywhere, but the Iraqi has not yet learnt the art of conserving transport and is inclined to drive his machines to death overloaded and under-lubricated. Travel by bus is popular, though there are no bus companies. Each busman borrows money to buy a bus, secures his fares by undercutting his competitors, charges prices that take no count of repair or replacement, and usually becomes quickly bankrupt. British advisers have pleaded in vain for a Ministry of Transport which might correct these faults. Local air services are practically non-existent, but they should have a great future if well organized. There is a magnificent and fully equipped Iraqi aerodrome at Baghdad, now the focus of air lines in the Middle East, and a large number of other aerodromes and landing grounds throughout the country which are maintained by the Royal Air Force.

DEFENCE.

Externally, Iraq is more susceptible of defence than would appear at first sight. Her frontiers indeed, except over short distances, run along no geographic feature and are of great length in relation to her meagre population. She possesses, however, a number of natural advantages. On the west is the desert, which, though passable by raiders and along certain routes by motor-car, is, owing to lack of water, impassable by large forces during most of the year, and, when passable, only by certain routes well defined by wells. There is indeed the route from Aleppo by the Euphrates, but the track is poor; it is over 500 miles in length and is susceptible throughout its length to air attack. To the North the railway from Aleppo to Nisibin affords a good approach for Turkish troops, and there is a good unmetalled motor road from Nisibin to Mosul. The railway, however, runs close to the Syrian frontier, and the road, which is ill suited for an advance except to mechanized forces owing to lack of water, lies for a large part of its way in Syrian territory.

The normal route that invasions have followed is from Jazirah Bin Omar to Zakho, and thence to Mosul. In this case the Tigris is available for transport provided a protective force is moved along the right bank. Forces are, however, very susceptible to air attack on the road from Jazirah and in the Zakho pass. Away from the river, this route also suffers from scarcity of water. There are other tracks through the mountains, of which the best is that from Julamerk to Amadia, but they are only fit for small columns with pack transport. On the East there are now two first-class roads from Persia. The more northerly, which comes in from Tabriz, is a fairly easy approach until on the Iraqi side

of the frontier it passes through two terrific defiles—the Rowanduz and Berserini gorges, which can be held with the greatest ease by quite small forces. The second is the " golden road " of Samarkhand, through Teheran and Kermanshah to Khaniqin and Baghdad. It is the historic route of invasion. But here again all the advantages lie with the Iraqis. The invading army would have a line of communications by road to Teheran of 500 miles, whereas the Iraqi army would have a close connection with Baghdad and Kirkuk by rail. Moreover, the invading army would have to pass, near the Iraqi frontier, through a series of defiles in which he might be heavily bombed. Baghdad is indeed unpleasantly near the frontier compared with Teheran, but Persia can hardly profit from that fact without a superior air force, which she seems at present unlikely to possess. A third line of invasion that has been used runs through the Anglo-Persian oil fields towards Basra. Iraq is here protected by the broad Shatt-el-Arab, and if allied with us would have the quick support of our Navy. It is possible also that an invader from the East might move by Merivan on Sulaimani, and thence on to Kirkuk ; but communications on the Persian side of the frontier are not yet sufficiently organized for an attack in force. The main attraction that Iraq has is the oil, but so many of the great Powers are interested in that commodity that diplomatic and economic, if not military, pressure might be brought from all sides against any would-be invader.

Thus as we tour the frontier we find that invaders from every direction have to overcome great natural obstacles, obstacles that are enhanced for them by the effect of modern weapons. On the other hand, Iraq is herself weak for defence. She has great length without depth, and her communications are none too good. From Basra to Zakho her small forces are distributed on a line 700 miles long, on any part of which they may be struck in flank. The first duty of the Government is, therefore, to make absolutely sure of the fidelity of the home front and to consolidate the minorities on its side so that they regard themselves as true Iraqi citizens. Iraq facing Sa'udia with Kurds at her back, or facing Turkey with Kurds and Assyrians on her flank, would be in a very unhappy position. However, the principal Kurdish chiefs hostile to the Government have recently been crushed and, by means of roads, civil administration is taking a strong hold of Kurdistan. A liberal policy in that area would set the seal on these results.

As regards our responsibilities as an ally, we have air bases now at Mosul, Hinaidi and Basra. In 1937 the squadrons at Mosul and Hinaidi must move to Dhiban, to the west of the Euphrates near

Fellujah, where a new aerodrome is being prepared for their reception in accordance with the terms of the treaty. From Dhiban and Basra, empowered to use all the aerodromes in Iraq, the Royal Air Force could render effective and immediate aid to the Iraqi army, and it could be quickly reinforced.

An interesting point in connection with the defence of Iraq is that each of the three countries by which, if we except Syria, she is surrounded is ruled by a dictator—Mustapha Kemal in Turkey, Reza Khan in Persia, and Ibu Sa'ud in Sa'udia. Though none of these dictators has shown the slightest sign of aggression, there is no doubt that an autocratic form of government gives to a military force a greater opportunity of delivering a sudden blow. It therefore demands a state of readiness above the normal on the part of nations on its borders. Iraq has this fact to remember on three of her borders. Moreover, it will be noted from the map how small she is compared with her neighbours. She naturally, therefore, has to consider the matter of defence rather closely. At the moment, fortunately, her relations with her neighbours are excellent except for some mild trouble with the Persians as to where the boundary should be drawn along the bed of the Shatt-el-Arab.

There was no discussion.

THE CHAIRMAN:

The Chairman, in summing up the lecture, recalled the variety of methods by which Iraq had been defended. He concluded that the experiment of handing over the administration of the country to the Iraqis themselves seemed to be going very well, but that British influence must remain predominant.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

ITALIAN AVIATION

By Flying Officer F. P. R. Dunworth, R.A.F.O.

(Acknowledgment is made to the following authorities for information obtained in compiling this article :—Jane's All the World's Aircraft, Armaments Year Book, Whitaker's, The Times, Keesing's Contemporary Archives, Rivista Aeronautica, Les Ailes, La Conquête de l'Air, Luftwehr and Aircraft by Captain P. H. Sumner.)

ITALY'S seaboard totals 4,950 miles of the Mediterranean and Adriatic Seas; to the North-West, North, and North-East run 1,220 miles of her land frontiers, bordered by France, Switzerland, Austria, and Yugo-Slavia. The country is mountainous, the Alps in the North rising to as much as 15,000 feet, and the Appennines traversing its entire length. There is a home population of 43,004,000 to be administered over an area of 124,000 sq. miles. There are also four large colonies—Tripolitania, of 360,000 sq. miles, with a population of 543,000; Cyrenaica, of 295,200 sq. miles, and a population of 161,000; Eritrea, 47,600 sq. miles, whose population is 598,000; and Somaliland, 236,000 sq. miles, population 1,091,000.

Historical and Political.

The study of aviation in Italy began with Leonardo da Vinci, during the period 1486 and 1490. Apart from his drawings and writings on parachutes, helicopters, and flapping-wing machines, he made the important deduction in 1505 that the beating of wings is not essential for flight. Coming to modern days, the Aero Club of Italy, or the "Società Aeronautica Italiana" as it was then called, was formed in March, 1904. During the War many engineering and shipbuilding firms and motor-car manufacturers became aircraft constructors, but not all of them survived the lean years directly after 1918. The revival of Italian industry began about 1923–24, and now there are many new firms producing aircraft, engines, and accessories. Among the older firms may be mentioned the famous Fiat company which was incorporated in 1898 and started on a policy which embraced all forms of locomotion. They first built aero engines in 1908, and are now producing aircraft and engines as well as every other form of transport and accessories.

The modern Italian aircraft industry may, however, be regarded as beginning in 1923–24, under an impulse given it by the new political regime that came into power about that time. There has only recently been evolved a definite industrial plan of campaign; indeed, Italian aviation is still in a state of flux. As will be seen later on, action is being taken to revitalize it; but the results of the action remain to be seen.

At the beginning of the "renaissance," the foreign policy with regard to aviation was rather short-sighted, and foreign commercial lines were forbidden to operate over the country. This policy has now been revised, and the signing of the Air Convention with Great Britain in 1934 marked the beginning of a reciprocal arrangement by which both British and Italians should benefit. British aircraft may now follow two of the following alternative routes over Italian territory when operating on their Eastern and South African services:—

(1) Rome–Naples–Tripoli–Bengasi–Tobruck.
(2) Rome–Naples–Brindisi.

Italian aircraft have the right to fly over the Sudan to reach East Africa; they may also land in Palestine and Trans-Jordania.

An air agreement with Egypt has also been reached. For some time now the need for an Italian air line to Egypt has been apparent for commercial and other reasons involving prestige in the East. At the moment the air services between Italy and Egypt are shared by the Dutch and British lines, but it is anticipated that an Italian line will operate in the near future.

Policy.

As has already been indicated, Italian aviation is becoming more and more a vital force in the country. It can challenge comparison with any in military spheres, and is rapidly achieving a front place in the commercial world. Italy has grasped the fact that the geographical situation of her colonies makes it necessary, in order to avoid possible international complications, for her to possess aircraft capable of flights that render landing on foreign soil or alighting in foreign waters unnecessary. To this end she is pushing forward the design and construction of long-distance weight-carrying, multi-engined aeroplanes. The Savoia firm especially are turning out these aircraft, details of which will be found later on. The design of these machines makes it possible for them to be rapidly converted into bombers—a not unimportant consideration when calculating her military air strength. Their commercial value has already been recognized abroad, for the Sabena

Company, a Belgian air line, has recently acquired three for their long-range services.

The prestige of Italian aviation abroad may be judged when it is realized that contracts to the value of lire 110,000,000 have been placed by foreign firms. Apart from this, the Government encourage to the fullest extent all efforts to run international lines. An agreement was concluded recently between the Air Ministry and the Ala Littoria, the largest air line, to ensure that a greater reliability be obtained and to carry out a programme for services out of the continent. In this connection preparations are being made for a trans-Atlantic service. The co-ordination of locomotion has greatly exercised the authorities, and they claim to have achieved a certain measure of success in this direction. As there are some 580 civil aircraft operating in or from the country, the magnitude of the task will be appreciated.

Despite the efforts that Italy is making in international aeronautical spheres, the Government have no intention of encouraging too great a foreign interest in their military aviation, for only in November last a law was passed prohibiting the publication of any news of a military nature, including manœuvres, performances, figures, etc. Also the many prohibited aircraft zones make it a matter of careful piloting if the foreign pilot is to avoid infringing some regulation or another. Against this is the fact that Italy recently decided to abolish landing fees to foreign pilots whose country would offer the same concession to visiting Italian pilots.

The Chain of Command.

The Italian Air Force is a separate arm of the fighting forces. It is administered at home by the Air Ministry, and abroad by the Ministry for the Colonies, although there is a commandant of the Colonial Forces who is solely responsible in all technical matters.

The first authority in all military questions is the Minister for War, who is responsible for all establishments connected with the defence of the country. In order to co-ordinate the military organization of the State, a Chief of the General Staff is appointed from the Marshals of Italy, the Admirals of the Fleet, the full Generals, and the Admirals commanding naval detachments. This officer acts as technical adviser to the Prime Minister in all matters relating to defence and war plans. He is kept informed of the naval, army, and air situations by the respective ministries, and acts in a consultative capacity on colonial military policy. The Supreme Council of National Defence is composed of the various ministers with the Chiefs of the three fighting Staffs

acting in an advisory capacity. An Air representative is also found on the Civil Mobilization Committee, and three senior air officers are appointed, with other officers, as Industrial Observers to keep in touch with the industrial situation in so far as it affects military questions. The Air Ministry has thus a direct link with the other services, and the system has proved distinctly successful both economically and strategically.

The Air Minister. has supreme authority, and works through his Chief of Air Staff and the Commandants of the Territorial Air Zones. The Ministry comprises the offices of Laws and Decrees, Propaganda, and the Department of the Under Secretary of State together with the various Directorates, which include training, research, and civil aviation. The Territorial Air Zones divide the country into three spheres of authority centred at Milan, Padua, and Rome. The Air Ministry is, however, contemplating the creation of a fourth zone with headquarters at Bari, which would administer part of the districts now under the command of the third zone at Rome, which, at present, controls the southern part of Italy, including Sicily, Sardinia, and the Dodecanes. The difficulties of such remote control may well necessitate this additional zone headquarters; apart from this, the Air Force is preparing for an *immediate* large expansion, which must inevitably mean that the technical and administrative developments will require a greater organization for their distribution. There are three construction and supply directorates in Turin, Milan, and Naples. Each zone headquarters follows similar lines to our own system of Air Commands, and consists of an Air Staff, Recruiting and Mobilization Staff, Administrative Staff, a Central Office for ensuring effective strengths at all periods, and a Training Staff. The unit of command is a "flight," which may consist of nine or twelve aircraft according to the duty it has to perform. A flight is usually homogeneous in composition. Two flights form a "squadron," two squadrons form a "regiment," and so on through "brigade" and "division" to "Air Corps." The Air Force consists of 42 Air Corps, 15 Observation Groups, and 4 Air Commands, together with a number of aircraft carried on board warships, making a total of 1,507 front-line aircraft. The Air Force Engineer Corps is a technical body which plans and supervises the construction of equipment, including wireless, armament, reception, maintenance, motor transport, and buildings. The Air Force Military Supply Corps administers the stores and accounts side of air force activities. The Colonial Air Forces consist of 3 flights in Tripolitania, 3 in Cyrenaica, 1 in Eritrea, and 1 in Somaliland. These are being reinforced, however, and last month more than 900 officers, pilots, and specialists embarked for East Africa. The air commands for East African Colonies are now in process of unification.

Work of the Air Force.

During 1934 the air force flew 185,176 hours, making a total mileage of about 20,000,000. The normal routine training was carried out, although more attention was given to long-distance and high-altitude work. A fighter squadron, equipped with Fiat CR 30 single-seat aircraft, flew round Germany, Belgium, and France, giving a display of formation aerobatics that greatly impressed everyone. Many British pilots, even those accustomed to the R.A.F. Display flying, will bear witness to the skill and daring of those Italian pilots, who literally became the idols of the crowds that thronged the continental aerodromes to watch their performance.

The training schools are divided into flying, technical, and commercial categories. The Regia Accademia Aeronautica is the cadet college for training flying officers. Recruits come from Civil schools for a three-year course. The Regia Accademia Aeronautica Caserta is a six months' advanced course for Captains. The Aircraft Apprentice School trains the personnel for all branches of military aviation. In addition there are advanced technical schools. There are three specialized schools—the Fighting and Pursuit School, the Observer School, and the Bombing School; also the Superior Institute of Commerce in Rome where the training of officers of the Paymaster Corps is completed.

The stations at Monte Celio, Vigna di Valle, and Furbara perform the same function as our experimental and research stations at Farnborough and Martlesham Heath. The details of their work are too multifarious to enumerate, but in general it comprises the study, testing, and improving of aircraft and aero engine design.

Italy has only one aircraft carrier, the "Miraglia," but urgent representations have been made in Parliament that, in view of the importance of Italy's coast line and sea communications, more should be built.

Thirty-two foreign officers carried out training with the Air Force last year, and visits were made by many foreign missions.

The air defences concern the Air Force only in so far as the active work of defence is concerned. The rest of air defence is controlled by the civil authorities in co-operation with the chemical concerns and services. The organization explains its position thus: "of a defensive character, but if we were provoked with means of this kind, we should be in a measure to face any emergency."

Service Air Stations

The home service aerodromes are located in the following areas: Turin, Milan, Venice, Rome, Naples, Brindisi, Central Italy, and the Coast Defence units. Some of these aerodromes are open to military and civil traffic, but the majority are devoted to the Air Force.

The Turin Area includes Mirafiori, where single seat fighters are concentrated, and Venaria Reale, a Reconnaissance Station. Further South is Spezia where both bombers and reconnaissance machines operate.

The Milan Area embraces Breso and Lonate Pozzolo. The former is for the use of day bombers and reconnaissance aircraft; the latter for night bombers. At Malpensa are also found some day bombers.

The Venice Area is mostly a concentration of single-seat fighters, although there are also day bombers and reconnaissance aircraft. The main aerodromes are at Venice, Pola, Campoformido, and Gorizia.

The Rome Area includes Centocelio and Ciampino as well as the experimental station at Montecelio. All types are stationed in this district.

The Naples Area contains some fighter coast defence aircraft, which are stationed at strategic points around the coast.

Brindisi and Taranto house reconnaissance machines and day bombers.

The Central districts may be taken to include Parma, Poggio, Ferrara, and Padua aerodromes, where night bombers, day bombers and reconnaissance aircraft are stationed.

The Coastal Area is divided in the same way as the naval coastal areas; the islands of Sardinia and Sicily being included. The types of aircraft are varied, but flying boat naval reconnaissance aeroplanes predominate in the district.

The colonial air force is entirely composed of bombers and reconnaissance aircraft, although the details of the reinforcements recently sent to Lybia are not yet obtainable.

When considering these aerodromes from the strategic point of view, it must be remembered that, as in other countries, the peace-time location of units may be altogether changed on the outbreak of war. Italy is relatively a small country for aircraft operations, and locations can easily be changed according to the needs of the moment. There are, however, many important Italian air bases within striking distance of our bases at Malta and Gibraltar, and of Aden; the lack of aircraft carriers would not put Italy at so great a disadvantage in

a Mediterranean war as other countries. The rapid development of the high-performance long-distance Italian bomber must again be emphasized; it places Italy in a strong strategical position in these waters.

Civil Aviation (Commercial).

As in this country, civil aviation is heavily subsidised. The subsidy has now been fixed at a standard amount of £765,736, which will be revised in 1938–39 according to the needs of the situation. The amount allocated to each regular Air Transport Company is decided on a kilometric basis within a certain maximum limit.

The Italian air lines showed a reliability of 96.40 per cent. in general, and a 99 per cent. reliability between stages. The co-ordination of air transport has greatly improved conditions.

The following are the principal lines now operating :—

Società Anomina Ala Littoria is the amalgamation of S.A. Mediterranea, S. Italia Servizi Aerei and S.A. Navigazione Aerea. This company has also bought a controlling interest in S.A. Aero Espresso Italiana. Its principal routes and distances are :—

Rome–Vienna, 323 miles, in co-operation with the O.L.A.G. Company of Vienna.

Rome–Venice–Munich–Berlin, 876 miles, in conjunction with the German D.L.H. Company.

Rome–Naples–Syracuse–Malta–Tripoli. 749 miles.

Rome–Naples–Palermo–Tunis. 553 miles.

Rome–Cagliari–Tunis. 483 miles.

Rome–Bari–Brindisi–Tuana–Salonika. 674 miles.

All services in Albania.

Rome–Genoa–Marseilles–Barcelona. 739 miles.

Trieste–Pola–Lussino–Zara–Lagosta–Durazzo–Brindisi. 625 miles.

As a result of the recent air convention it is proposed to run services between Rome and Paris, and Rome and London, using the new fast S.74 aircraft.

Società Anonima Aero Expresso Italiana.

Brindisi–Athens–Rhodes. 736 miles.

Brindisi–Athens–Istambul. 893 miles.

Società Anonima Nord Africa Aviazione. This society is subsidized by the Colonial Government.

Tripoli–Sirta–Bengasi. 580 miles.

Cirene–Derna–Tobruk. 250 miles.

It is proposed to extend the second line through Mersa and Matruk

to Alexandria. Another proposal is a route to Somaliland through Rome–Brindisi–Athens–Alexandria–Cairo–Suez–Port Sudan–Massawa–Aden, a total distance of 4,955 miles.

Società Anonima Avio Linee Italiana.

Milan–Turin. 87 miles.
Milan–Rome. 323 miles.
Milan–Munich, 285 miles, in co-operation with D.L.H.
Milan–Zurich, 152 miles, in co-operation with Swissair.

Civil Aviation (Private Flying).

The Aero Club of Italy is the Federation of the Italian societies that devote themselves to aeronautics. There are now over 72 clubs in Italy, Sicily, and the colonies associated to the Aero Club, which is a considerable increase over previous years. The State grants 13,000 lire for each member of a club that qualifies for a pilot's licence, of which 1,000 lire is a cash prize for the successful pilot. Further to facilitate private flying, arrangements have been made for the State to bear a certain share of the cost of new aircraft. The Aero Club is organizing free flights to its members; for this purpose a Caproni C.A. 101 will tour the country, stopping at each of the principal civil aerodromes. A grand international Rally is to be held at the Littorio Air Port, Rome, from 24th August to 30th August, 1935, when international aeronautical contests will be held.

Gliding is a very popular feature of Italian aviation, and there are 57 provincial gliding schools frequented by youths from 14 to 18 years of age. Gliding is also incorporated in the early training of military pilots. This civil support should enable Italy to attain her desired reserve of 10,000 pilots with ease.

Aircraft and Aero-Engine.

The trend of design in long-range aircraft has already been noticed. Equally important is the attention that Italy is paying to the development of her fast single-seat, high-performance fighters. Italy's defences are spread over a wide area, and her problem therefore differs from the British task of concentrating aircraft of the interceptor type around London. Thus we find the Italian fighter more resembling the American "pursuit" type of aeroplane. It is, of course, impossible to describe more than a proportion of types; those that follow are the aircraft that in all probability will be operating during the next five years :—

Breda 32 is a commercial monoplane carrying eleven passengers.

It has three engines of American design and is capable of a top speed of 147 m.p.h. It cruises at 131 m.p.h.

*Fiat C.R.*30 is a single-seat biplane fighter with a Fiat A 30 R twelve-cylinder V water-cooled engine. It has a top speed of 230 m.p.h. and can climb to 19,680 feet in 12 minutes 30 seconds. A development of this type, the *Fiat C.R.*32, with a more powerful engine, will be the standard re-equipment within the next three years of all fighter squadrons at present flying obsolescent aircraft.

*Savoia S.*72.—A three-engined bomber with a top speed of 183 m.p.h. and a cruising speed of 152 m.p.h. The power units are " Pegasus " engines, a British product made under licence in Italy.

*Savoia S.*73 is an eighteen-passenger aeroplane with three Piaggio Stella X R.C. engines. It is capable of 208 m.p.h. and cruises at 190 m.p.h., and has a ceiling of 23,000.

*Savoia S.*74.—A long-distance commercial monoplane capable of seating twenty-seven passengers. It cruises at 186 m.p.h., top speed 202 m.p.h., and is powered by four Piaggio Stella IX R.C. radial air-cooled engines of 700 h.p. each.

*Savoia S.*78.—One Isotta Fraschini Asso. R. engine of 750 h.p., and will be used on naval reconnaissance.

*Savoia S.*79 is an eight-seat passenger aeroplane capable of 249 m.p.h. It cruises at 218 m.p.h. and has a ceiling of 23,300 feet. Three Piaggio Stella X R.C. engines provide the power.

The *Caproni* 111 light bomber will also be used for co-operation work. It has an Isotta Fraschini A.R. 700 h.p. engine and is capable of a range of 683 miles at a top speed of 174 m.p.h.

Among the latest passenger aircraft may be quoted the *Fiat G*18, two Fiat A59R 700 h.p. engines, with a range of 500 miles. It carries eighteen passengers at a top speed of 211 m.p.h. and cruises at 187 m.p.h., and can attain a ceiling of 19,685 feet ; the *Fiat A.P.R.*2, of similar engine power with a range of 1,243 miles. The top speed is 242 m.p.h. ; the *Caproni* 123, with two Gnome 14.K 880 h.p. engines, capable of carrying 20 passengers at 211 m.p.h. over a range of 932 miles.

The famous *Macchi-Castoldi* 72 was originally built for the 1931 Schneider Trophy Race, but was prevented from taking part owing to engine difficulties. These defects, however, were remedied eventually, and further development resulted in gaining the world's speed record, which it still holds. The engine is a 3,100 h.p. Fiat A.S.6 twenty-four-cylinder V engine driving two tractor screws in opposite directions. The aircraft and engine are, of course, purely for racing machines. Almost equally famous are the *Savoia-Marchetti S*55 *and S*55*X* twin

hulled flying boats. Twice used for Atlantic crossings under the command of H.E. the Marshal Balbo, the aircraft have a top speed of 173 m.p.h. and cruise at 146 m.p.h. They are normally employed as twin-engined bombers or torpedo carrying aircraft.

The development of the aero-engine has resulted in the powerful Fiat, Isotta-Fraschini, and Piaggio engines. The Fiat A.S.6 was fitted in the record holding Macchi, and is worth describing for its ingenious design. It is actually composed of two twelve-cylinder V units, placed end to end, with a reduction gear between. The crankshafts run in opposite directions and are geared to drive the airscrew shafts, which revolve one inside the other, driving two adjustable-pitch airscrews, placed one in front of the other. The power weight ratio is 0.70 lb. per horse-power, and the maximum output is 3,100 h.p. at 3,200 revolutions per minute.

Achievements and Aspirations.

The value of holding records is reflected in the enormous gain in the prestige of Italian aviation, supported, of course, by the skill and success of their pilots in accomplishing these and other flights of world-propaganda importance. The flight of the Italian air " armada " from Rome to Chicago and back in 1933 is too well known to need recapitulation here. It is sufficient to say that it was a triumph of organization, preparation, and execution. The flight that received less general acclaim, although in its way it was equally successful, was the crossing of the South Atlantic from Bolania, in Portuguese Guinea, to Port Natal, in Brazil, in January, 1931. Both these flights were commanded by the then General Balbo. A more recent achievement was the flight of Stoppani in a CANT2.501 (Isotta-Fraschini) from Montefalcone to Massawa, in Eritrea, on 18th October, 1934. The distance of 2,561 miles was covered in 26 hours 35 minutes.

Within the last few weeks two notable flights have been accomplished. A bomber of the Savoia S.74 type flew from the experimental station at Monte Celio, near Rome, to Tripoli in 3 hours 40 minutes, at an average speed of 187 m.p.h. A passenger-carrying S.74 with a load of thirty-one passengers, including some of the most important personages in Italian aviation, and a crew of four, flew from Milan to Rome at an average speed of 196 m.p.h. These speeds represent an enormous development in construction and design.

The main records of the air are speed, height, and distance. Of these speed and height are both held by Italy. On 11th April, 1934,

Renato Donati, in a Caproni 113 (" Pegasus " engine of English design, but built under licence in Italy), reached 47,352 feet, or approximately nine miles above the earth. Later in the year, on 23rd October, Lieutenant Francesco Agello, in the Macchi seaplane described elsewhere in this article, attained the fantastic speed of 440.76 miles per hour. Other records, in closed circuits and other classes recognized by the Fédération Aéronautique Internationale, are also held by Italy. The success of their high altitude aircraft inspired the Government to establish a high flying flight at Monte Celio, where all kinds of altitude research is carried out, particularly that applicable to military tactics. Recently Captain Tondi, a member of this flight, reached a height of 40,190 feet, using the Caproni flown by Donati on his record attempt. The authorities have displayed exceptional interest in this high-altitude work, and they are arousing keen competition among the aircraft manufacturers for the development and realization of stratosphere flying. To this end prizes are being offered for the production of aero-engines developing not less than 500 h.p. up to 33,000 feet, and for designs for an aeroplane capable of some performance in the stratosphere.

The design of suitable flying clothing is also of paramount importance, and is being encouraged. In fact, with the possible exception of Russia, Italy is making greater efforts to achieve practical high-altitude flying than any other country.

1,200,000,000 lire has been allocated for re-equipping the Air Force and Air Lines. The latest technical improvements will be incorporated in the new aircraft thus obtained, including controllable pitch airscrews, increased lift ratio and retractile under-carriages. Other experimental work from which great results are anticipated are the series of heavy oil engines :—Levi Casé mono cylindrical experimental unit ; the Vanni nine-cylinder Diesel radial ; the S.T.I.M.A. two-stroke Diesel twelve-cylinder water-cooled engine of 850 h.p.

Conclusion.

It is impossible here to make more than a passing mention of General Douhet, whose doctrines on aerial warfare were finally accepted about 1928–29. Italy has had her share of active air commanders, perhaps the most famous being H.E. the Marshal Balbo, now Governor of Libia. Even his popular period of office was criticized for its extravagance and short-sightedness, and now the portfolio is in the hands of the Duce, who is ably assisted by his Under-Secretary of State, General Valle.

The aim of the authorities is to make the nation self-sustaining and independent of supplies from abroad. The expansion of aviation, the

suggestions of nationalizing the oil industry, the encouragement of raw material production (Italy has the elements of light alloy in large quantities) all indicate that this aim is being enthusiastically sought after. High-speed and long-range aircraft are the keynotes of the Italian aircraft industry. Before 1936 the military and civil air forces will be completely re-equipped and expanded. Italy can now boast a front-line fleet of 1,507 military aircraft, but the rate of expansion is dependent on many things. There will be no air displays this year at home or abroad, for, as General Valle said: " times are such that they do not permit dispersion of energy for any other reason than the most methodical and severe military preparations."

THE INTERNATIONAL SITUATION

GERMANY'S CHALLENGE TO THE LEAGUE OF NATIONS

DURING the past few months, there have taken place a series of expositions, visitations, and conversations in London and on the Continent, followed by resolutions and declarations at Geneva which, far from promoting that international tranquility without which there can be no real peace, have raised a very turmoil of suspicions, fears, and resentments all tending to hasten the general re-armament.

Germany is regarded as "the villain of the piece," but it is of interest to summarize the course of international events which have led to the present diplomatic debacle.

THE PROPOSED AIR PACT

Following a meeting of British and French Ministers in London, an announcement was made on 3rd February which, after expressing our Government's cordial approval of the Franco-Italian Agreement of 7th January,[1] and the hope that Germany would co-operate in future efforts, proclaimed the fact that Britain and France had agreed to promote a new Pact whereby "the signatories would undertake immediately to give the assistance of their air forces to whichever of them might be the victim of unprovoked aerial aggression by one of the contracting parties."

Italy, Germany, and Belgium were invited to negotiate such a convention. As an additional inducement to Germany to return to the League of Nations, reference was made to a settlement to be freely negotiated between that country and other Powers aiming at "equality of rights in a system of security" which would embody new agreements replacing those sections of the Versailles Treaty which affected her armaments.

This proposed Pact was referred to by Sir John Simon, the Foreign Secretary, as an Air Locarno. It would commit us to sending our Air Force to the immediate assistance of any of the signatories who

[1] See February JOURNAL, p. 170.

might be the victims of air aggression; on the other hand, unlike the original Locarno Pact, we should benefit by a reciprocal guarantee.

Italy and Belgium favoured the proposal; the Italian Press particularly welcomed the British disposition to intervene actively on behalf of a European Power.

Germany returned a guarded reply. While the general idea of such an Air Pact was approved, and her readiness was expressed to "employ her aerial forces as a deterrent against disturbances of the peace," her government thought it desirable "to clarify, in separate conversations with the governments concerned, a number of preliminary questions of principle." Semi-official pronouncements, however, openly delighted in what, it was claimed, amounted to recognition by Britain and France that Germany already possessed an air force of account; this, it was argued, was proof that at least one of the prohibitions of the Versailles Treaty was tacitly at an end. The German Note also mentioned the intention of the government to examine, in particular, means of averting an armaments race "which has arisen through the failure of the highly armed Powers to carry out the disarmament provided by treaty."

The Soviet Union, although officially approving the Anglo-French proposals, was evidently somewhat suspicious of this Western Pact, and the *Pravda*, rightly, forecasted that it would result in the rearmament of Germany.

GERMANY'S CLAIMS

Following on this London Declaration, it was arranged that Sir John Simon, with Mr. Antony Eden, should go to Berlin and discuss the situation with Herr Hitler and his advisers. On the eve of their departure the British White Paper on Defence[1] appeared. Certain remarks in this regarding German rearmament caused strong resentment in that country, and when on 5th March the visit was postponed because Herr Hitler had contracted a bad cold and lost his voice, the maximum amount of sensation and mischief was made out of the coincidence by the less responsible sections of the Press both at home and abroad. But the visit took place later in the month, and there can be no question but that Herr Hitler's plain speaking cleared the air of a great deal of hypocrisy and illusion with which the international situation has been cloaked in the Elysian surroundings of Geneva.

In a summarized statement on this visit made in the House of

[1] See "General Service Notes," p. 415.

Commons on 8th April, the Foreign Secretary said that Germany was not prepared to sign the so-called Eastern Pact, and, in particular, would not enter into a pact of mutual assistance between herself and Russia. Herr Hitler was not prepared to contemplate the inclusion of Lithuania in any pact of non-aggression. He dwelt on the difficulty of identifying the aggressor in mutual assistance pacts. In regard to land armaments, he stated that Germany required 36 divisions—550,000 soldiers of all arms, including a division of S.S. and militarized police troops. He claimed the right to possess all types of arms possessed by other countries. As regards naval armaments, Germany claimed, with certain reserves, 35 per cent. of British tonnage. In the air she required parity with Britain or France unless the development of the Soviet air force necessitated a revision of these figures. Germany was prepared to work a system of supervision of arms in conjunction with other Powers.

Herr Hitler further referred to his statement in May, 1933, that Germany would not participate in the League of Nations if she was to remain as a " country of inferior right." He made a pointed reference to her " inferiority " as long as she had no colonies.

Since then, on 29th April, formal notice has been received from the German Government that they have ordered twelve submarines of 250 tons displacement. This is the first open breach of the naval clauses of the Versailles Treaty.

In effect, therefore, it is the obvious intention of Germany to recover everything she lost in the War. In spite of her protestations of peace, it is plain that, unless the late allies are sufficiently well armed to make the risks too great, she will, sooner or later, fight for what she wants if she cannot obtain it by any other means.

The Moscow Visit.

Mr. Eden, Lord Privy Seal, travelled to Moscow on 26th March and had two days of " conversations " with M. Stalin and M. Litvinoff. The Soviet Union favoured " collective security " and desired to see Germany and Poland participating in an Eastern Pact.

It is interesting to notice that Russia, which for so long would have nothing to do with the League of Nations, is now a warm supporter of it. In this one can trace the fear of isolation and the effects of the persistent wooing of her old ally, France, who to-day is ardently seeking support wherever she can find it.

The Warsaw Visit.

From Moscow, Mr. Eden went to Warsaw on 31st March to see Marshal Pilsudski and Colonel Beck, Polish Minister for Foreign Affairs. Poland, it was stated, had established a friendly understanding with the Soviet Union on the one hand and Germany on the other, and whilst she was not averse to the idea of a Central European Pact, she did not wish to upset good relations with her two powerful neighbours.

The Prague Visit.

From Warsaw, Mr. Eden journeyed to Prague where, on 4th April, he had a " conversation " with Dr. Benes. This appears to have been particularly cordial and the two statesmen found that there was " perfect identity in the aims and policy of the two governments as regards . . . their sincere and unchanging attachment to the policy of the League of Nations."

THE THREE-POWER CONFERENCE AT STRESA.

The great anxiety caused in France, and to a less extent in Italy, by Germany's open rearmament was mainly responsible for a meeting of representatives of the governments of the three allies in the late war at Isola Bella, Stresa, on Lake Maggiore, on 11th April. Such importance was attached to this conference that it was attended by the British Prime Minister, Mr. Ramsay MacDonald, and Sir John Simon ; also by the French Premier, M. Flandin, and the Minister for Foreign Affairs, M. Laval ; while Signor Mussolini acted as host and chairman.

This august assembly, faced with the realities of a situation brought to a head by Herr Hitler's outspoken declaration to Sir John Simon, was compelled to admit that the whole basis on which the Disarmament Conference had been built had broken down.

The only practical results of the Stresa meeting were :—

(1) Agreement of a common line of conduct in regard to the French protest to the League of Nations on German rearmament.

(2) Decision to arrange an early meeting of the Powers concerned with a view to concluding a Central European Agreement, aimed chiefly at safeguarding the independence of Austria.

(3) Decision to develop the proposed Air Pact for Western Europe.

(5) Agreement to examine the desire of Austria, Hungary, and Bulgaria for a revision of their military status.

The Conference expressed the intention of all three Powers to oppose " by all practicable means any unilateral repudiation of treaties which may endanger the peace of Europe," and " to work in close and cordial collaboration for this purpose."

FRENCH PROTEST TO THE LEAGUE.

On 14th April the text was published of a Note addressed by France to the League of Nations on the subject of Germany's rearmament, especially in relation to her proclamation on 16th March that she was reverting to conscription ; this, the Note asserted, was " the culmination of efforts long and methodically pursued in secret."

France accuses Germany of having broken the bond which she gave on entering the League of Nations to " observe her engagements arising from the Treaties." She defends her own military activities, and makes Germany responsible for the failure of efforts to establish, by Pacts of non-aggression, consultative and mutual assistance, a broad measure of collective security. She calls upon the League Council to " study measures adequate to remedy the situation created to-day, as well as to prevent its renewal."

LEAGUE RESOLUTION.

On 16th April, M. Laval submitted a Resolution to the League of Nations Council condemning Germany's repudiation of military restrictions. Poland, at first, criticized the Resolution, but afterwards came into line with the majority. Denmark proposed a number of amendments ; these having been rejected, her representative abstained from voting. M. Litvinoff, with an eye on Japan, desired to extend the condemnation of Treaty repudiation to countries outside Europe. This was merely asking for additional trouble and was resisted by Sir John Simon and M. Laval. The Soviet Union therefore joined Argentina, Australia, Great Britain, Chile, Czechoslovakia, France, Italy, Mexico, Poland, Portugal, Spain, and Turkey in voting for the French Resolution.

The Resolution, although chastising Germany verbally on half a dozen or more counts, and admitting that such repudiation of international obligations " may endanger the very existence of the League . . ." finally takes refuge in that last resort of diplomatic or political impotence—a Committee !

This Committee, on which thirteen Powers, including Great Britain, are represented is investigating " measures to render the Covenant more effective in the organization of collective security, and to define

in particular the economic and financial measures which might be applied should, in the future (*sic*), a State, whether a member of the League of Nations or not, endanger peace by unilateral repudiation of international obligations."

Meanwhile the German Government on 20th April sent a Note in reply, challenging the right of the governments responsible for this Resolution to judge Germany. They see in it another attempt to discriminate against her and "reject the Resolution in the firmest manner."

The situation as between the League and Germany strikingly recalls that which existed before the United States came into the war, when each new "outrage" and "indignity" caused Mr. Woodrow Wilson to make increasing demands on his typewriter. Ultimately, as we know, there was only one way of bringing Germany to book. Whether history will repeat itself, only time can show; but what matters most of all is that Britain is by no means as well prepared to play her part in the solution of European difficulties as she was in 1914, and much ground must be recovered by her fighting Services before she retrieves what has been thrown away for that international idealism which has now been shattered by Germanic realism.

WITHDRAWALS FROM THE LEAGUE OF NATIONS

ON 24th February the Paraguayan Government informed the Secretary-General of the League of Nations of their intention to secede from the League as from 24th February, 1937. The date of this notification coincides with the date upon which Bolivia is released from the obligation not to resort to war under Article 12 of the Covenant.

This action by Paraguay is the direct outcome of the discrimination shown in favour of Bolivia as against Paraguay in the matter of the export of arms.

Paraguay is the fourth country to resign from the League of Nations on account of disagreement concerning policy. The first was Brazil who withdrew in 1926. The second was Japan who resigned in March, 1933, over the question of her action in Manchukuo. The third was Germany who retired over the matter of her own re-armament in October, 1933.

The withdrawal of Japan, which was intimated to the Secretary-General in March, 1933, has thus become effective and complete in March, 1935.

ITALY AND ABYSSINIA

THE affray between Italian native levies and Abyssinian troops that took place at Walwal on 5th December, 1934, appears to have been rather more serious than was at first reported.[1] The Italian casualties amounted to about a hundred, whilst the Abyssinians lost heavily.

The clash was apparently precipitated by the refusal of the Italian commander to permit the British-Abyssinian Boundary Commission to have access to the wells at Walwal. By some mischance the Italian Government's instructions to this officer to allow the Commission to continue to Walwal had not reached him. In the past it had been customary for the nomadic tribes, from both British and Abyssinian territory, to frequent these wells, which are of some importance. But of recent times the Italian authorities have undoubtedly attempted to deny, as far as possible, the use of the wells by these tribes as freely as in the past. It seems, moreover, that the Italian penetration throughout this area has become more systematic of late years. Hence the growing tension between the Italian and the Ethiopian authorities in the whole region.

The affray of 5th December was followed, so it is credibly reported, by the Italians bombing from the air the Abyssinian headquarters at Gergolubi on 7th December and again on 12th December. On 29th January and on 2nd February further armed encounters are said to have taken place. It is stated that as a result of this fighting the Abyssinians recaptured two localities named Afdub and Scillave: there were casualties on both sides. The Abyssinians deny having re-occupied any territory.

This protracted frontier bickering has not facilitated the solution of the boundary question. The Italians demanded apologies and compensation from the Ethiopian Government; the latter wished to refer the question, as it stood, to arbitration under the Italo-Abyssinian Treaty of 1928. On 16th December Abyssinia presented a protest to the League of Nations at Geneva. As a result of the renewed fighting already mentioned, between 5th and 11th February Italy mobilized two divisions, the "Gavinana" at Florence and the "Peloritana" at Messina "as a precautionary measure." for service in East Africa. Only contingents of the class of 1911 were called up; the total troops mobilized, according to Italian official documents, did not exceed 20,000 to 25,000 men. On 4th February the Ethiopian Emperor issued

[1] See JOURNAL for February, 1935, p. 164.

a proclamation denouncing the Italian action and again demanding that the matter should be referred to arbitration. He further stated that the first step towards this end would be to demarcate a neutral zone in the contested territory: in accordance with his desire the Abyssinian troops would be drawn back from the whole region under dispute. The Italians, however, delayed making any concession whatsoever to the Ethiopian Government. Three picked battalions of "Blackshirts" (Fascist Militia) were sent to Eritrea and the embarkation of the two divisions followed in three echelons. These divisions were accompanied by a considerable force of aircraft. The Italian War Minister issued a statement deprecating the belief that the Italian mobilization possessed any European significance.

In the meantime Abyssinia repeated her intention to seek a pacific solution of the dispute and reiterated her protests at Geneva. At length, on 5th March, an agreement for the demarcation of a neutral zone was concluded, and instructions were issued by both sides to the respective commanders on the spot. But as nothing further resulted from the direct negotiations carried on between the two governments, on 19th March Abyssinia lodged a definite appeal with the League of Nations with regard to arbitration in the Italo-Abyssinian dispute under Article 15 of the Covenant. Italy denied the Abyssinian allegations as to her large military preparations and inquired whether the Ethiopian Government could not continue direct negotiations for a settlement of the dispute. On 1st April the Abyssinian Government laid a proposal before the League of Nations for setting up a board of arbitration to settle the frontier dispute with Italy. In the meantime both Governments were to refrain from all military preparations. On 11th April the Italian Government addressed a memorandum to the League of Nations and agreed to place the matter of the Abyssinian dispute before arbitrators.

THE GREEK REVOLUTION

IN March, 1933, General Plastiras had made an unsuccessful attempt at a *coup d'état* in Greece; this followed immediately on the general election by which M. Tsaldaris had succeeded in securing a majority. In the Greek army and navy there have always existed political undercurrents which at this time split the services in two: there was the Royalist element which supported M. Tsaldaris, while the Republican sympathizers were headed by General Plastiras and M. Venizelos. Under the auspices of the latter there had been

formed a League for the Defence of the Republic which had its headquarters at Salonika.

M. Tsaldaris and his supporters attempted to stifle political interests in the army, and in so doing dismissed several divisional generals and other officers. It was these men who had formed the nucleus of Plastiras' unsuccessful coup in March, 1933.

In April of this year elections were due to take place for one-third of the seats in the Senate, in which the Opposition had a majority: they did not have a majority in the Chamber of Deputies. A storm was clearly brewing over the manner in which this election was to be held and over its impending significance. General Plastiras arrived on the Græco-Bulgar frontier and prepared a rising. M. Venizelos, however, thought the moment inopportune. Plastiras then returned to Cannes, his normal place of residence, and drew up a scheme for an armed coup to take place on 25th March, the Greek national holiday. The Government was to be deposed and the persons of the Ministers were to be seized when assembled that morning in the cathedral at Athens. The Greek police seem to have got wind of the plot; it has even been stated that M. Venizelos, having been given an inkling of the state of affairs, gave the signal for the attempt without waiting for General Plastiras.

On 1st March the Venizelists seized the greater part of the Greek navy, the arsenal of Salamis, one of the barracks, and the Cadet Academy at Athens. The Capital and the arsenal were evacuated by the insurgents, but not before they had committed several acts of sabotage. The whole of the Greek islands and Eastern Macedonia were in their hands. The Government could only muster two ancient cruisers, some torpedo craft, and six submarines; in fact they had lost control of the sea and of all communications with insular Greece. In Eastern Macedonia an entire army corps went over to the insurgents. The internal situation of Greece could not be said to favour the Government. The agrarian crisis and prevalent unemployment strengthened the movement; but the landowning and banking interests were opposed to it.

The actual naval and military operations that now ensued are of little interest save in the matter of the bombing of the insurgent ships by the government aircraft.[1] The ships were directed to Crete, probably with the intention of supporting M. Venizelos in his attempt to secure the help of the island, his native home. On their way they were attacked by aircraft, but they reached their destination; they seem, however, to have exercised little influence on the course of affairs.

[1] "General Service Notes," p. 418.

It is probable that they would have done better to have made direct for Salonika, the real focus of the insurgent movement.

In the meantime General Kondylis, the Minister for War, took command of the Government forces and made for Eastern Macedonia. Operations were hindered by bad weather and snow. But on 6th March government aircraft bombed the town of Kavalla and raked the streets with machine-gun fire: other aircraft bombed insurgent troops at Seres. The insurgent leader, General Kamenos, attempted to rally all reservists resident in Macedonia to his cause, but met with little success.

At length Kondylis moved forward against the rebels with a force estimated at roughly 15 battalions, 30 aeroplanes, a strong force of artillery and some 3,000 cavalry.

Kondylis' main effort was directed against Orliako bridge, a crossing of the R. Struma, some 30 miles North-East of Salonika. The rebels do not appear to have taken up any definite position, nor do they seem to have offered any serious resistance. Two other columns crossed the R. Struma, one on either flank, but nowhere did serious fighting take place. Three government destroyers steamed to Kavalla and bombarded the rebel cruiser, " Helle," in harbour with unknown results.

The aircraft, in the meantime, continued bombing all the rebel encampments at or around Kavalla, Seres, and Drama. Everywhere these attacks seem to have caused considerable demoralization. The insurrection was now collapsing and surrenders of the rebels were beginning. No further fighting took place. General Kamenos and the majority of his staff thereupon fled into Bulgaria, so that by 12th March the revolution was practically crushed. Kamenos attributed his failure to the landing of government troops in his rear at Dedeagach, to a total lack of means to prevent the demoralization of his troops by air attack, and lastly, to the lack of support and failure to provide reinforcements from Crete.

Courts-martial passed sentence on numerous officers implicated in the revolt, but Major-General Kamenos and nine others condemned to death, are believed to be still in Bulgaria. Major-Generals Anastasios and Koimissis were, however, less fortunate and paid the price of their republican sympathies with their lives on 24th April. Nevertheless Greece, at present, remains a republic.

GENERAL SERVICE NOTES

IMPERIAL DEFENCE

Preparatory to the introduction of the Service Estimates for the current financial year and a debate in the House of Commons on defence as a whole, the Government issued, on 4th March, a " Statement Relating to Defence." [1]

GOVERNMENT POLICY.

The Statement opened with a recapitulation of the chief methods by which H.M. Government had pursued the establishment of permanent peace. These may be summarized as follows :—

(1) Support of the League of Nations.

(2) Efforts to produce collective security and a sense of security, notably :—

- (*a*) The Briand-Kellogg Pact of 1928, renouncing war as an instrument of policy.
- (*b*) The Quadruple Pacific Treaty and the Nine-Power Treaty regarding the Far East.
- (*c*) The Locarno Treaties relating to certain countries of Western Europe. A recent development is the Anglo-French proposal for an air pact.
- (*d*) Various proposals for increased security in Eastern Europe and the Danube basin.

(3) Efforts to promote international understanding generally, and especially with countries which had been enemies in the late War.

(4) Efforts to effect the reduction and limitation of armaments.

The Statement then goes on to say, " Hitherto . . . public opinion in this country has tended to assume that nothing is required for the maintenance of peace except the existing international political machinery, and that the older methods of defence—navies, armies, and air forces— . . . are no longer required. The force of world events, however, has shown that this assumption is premature, and that we have far to go before we can find complete security without having in the background the means of defending ourselves against attack . . . events in various parts of the world have shown that nations are still prepared to use or to threaten force under the impulse of what they conceive to be a national necessity ; and it has been found that once action has been taken the existing machinery for the maintenance of peace cannot be relied upon as a protection against an aggressor. . . . The National Government . . . can no longer close its eyes to the fact that adequate defences are still required for security and to enable the British Empire to play its full part in maintaining the peace of the world."

After pointing out that " Parliament and people . . . have been warned again and again that serious deficiencies were accumulating in all the Defence Services," the White Paper remarks, " We have not contributed thereby to general disarma-

[1] White Paper Cmd. 4827, price 2d.

ment, and are approaching a point where we are not possessed of the necessary means of defending ourselves against an aggressor."

After pointing out that the Disarmament Conference had virtually come to a standstill, it is asserted that " unless a programme was put in hand to recondition the Defence Forces and to bring them up to date, the country and the Empire would no longer possess an adequate standard of defence . . . we should be unable to secure our sea communications, the food of our people or the defence of our principal cities and their population against air attack."

THE NAVY.

" . . . The Navy is, as always, the first line of defence for the maintenance of our essential sea communications. . . . So long as the Navy is strong enough to perform this task, and the other Defence Services are equipped to co-operate in the defence of ports and of the narrow seas, our food supplies will be safeguarded ; the members of the British Commonwealth of Nations will be able to render each other mutual support to the extent that each may decide, and the trade . . . of the Empire . . . will be maintained."

" . . . the power and range of air forces have increased the vulnerability of this country. This is an added burden, but . . . the protection of the sea communications . . . remains. . . . Our merchant ships on the vast ocean spaces [are] as open to naval attack as before. The necessities of naval defence remain therefore unaltered."

The Main Fleet is the basis upon which our naval strategy rests, but considerable numbers of cruisers are required over and above those forming part of that Fleet to deal with detached enemy units making sporadic attacks on territories and trade.

The Capital Ship.

The capital ship remains the essential element upon which the whole structure of our naval strategy depends. The age of our battleships renders it necessary to commence their replacement at an early date, but the extent of new construction will be subject to any agreement reached at the forthcoming Naval Conference.

It is hoped to secure an arrangement which will avoid competition in naval armaments while leaving us free to maintain a fleet at the strength necessary for our absolute requirements. It is essential that the minimum numbers should be maintained.

Aircraft are becoming more and more important to the Navy. If our ships are less well equipped than those of possible enemies, they cannot perform effectively their defensive functions.

" Ineffective defence means not only waste, but defeat."

THE ARMY.

The bases and fuelling stations of the Fleet and harbours used by merchant ships require defences against sea-borne and air attack on scales which vary with their geographical position and other circumstances.

At the present time the defences of our ports need modernizing. The matter is one involving concerted action between the three Services, but the heaviest expenditure falls on the War Office.

The Army Estimates, besides providing for the improvement and installation

of coast defences make provision for a large expansion of anti-aircraft defences. In addition the Army requires to be modernized by the provision of up-to-date equipment, mechanization, transport, and reserves of war material which have fallen below required standards.

If inadequately equipped or without sufficient reserves of ammunition, the Army would be exposed to heavy loss, suffering, and possible disaster.

THE ROYAL AIR FORCE.

" The Royal Air Force has, as its principal role, to provide (with the co-operation of ground defences) for the protection of the United Kingdom, and particularly London, against air attack. It also provides Air Forces for general defence purposes in the Middle East, India, and the Far East, as well as for co-operation in Coast Defence (a subject which is being closely studied by the three Defence Services in co-operation at the present time) ; and, in addition, furnishes specially trained and equipped squadrons for co-operation with the Army, and a proportion of the Fleet Air Arm personnel for work with the Navy. The Air Squadrons at home provide, in addition, a reserve of air squadrons for employment in any part of the world in an emergency."

The range of territory on the Continent of Europe from which air attack could be launched against this country is constantly extending ; and if, in war, an enemy were in possession of the countries bordering the Channel the area of Great Britain liable to attacks would be still further increased. The weight of the attack would be much greater owing to the quicker " turn round " of the bombers and their increased bomb load at shorter ranges. The increase in speed, range and height [of modern aircraft] accentuates the difficulty of obtaining warning in time to bring defensive aircraft into action in favourable conditions.

For these reasons the importance of the integrity of certain territories on the other side of the Channel and North Sea, which for centuries has been, and still remains, a vital interest to this country from a naval point of view, looms larger than ever when air defence is taken into consideration.

In view of the time required to provide the necessary forces, and the obscurities of the international situation, no Government mindful of its responsibilities could neglect to provide such defence as is necessary to secure the safety of the country.

Protection of the Civil Population.

The Government intend to develop precautionary measures designed for the protection of the civil population and the safeguarding of essential services against the effects of bombing attacks from the air. Similar action has already been taken by most of the countries on the Continent.

CONCLUSION.

While it is the aim of the Government to promote peace, " . . . in the present troubled state of the world they realize that armaments cannot be dispensed with. They are required to preserve peace, to maintain security, and to deter aggression. The deliberate retardation of our armaments . . . has brought them below the level required for the fulfilment of these objects. . . . An additional expenditure on the armaments of the three Defence Services can, therefore, no longer be safely postponed."

The Statement is initialled by the Prime Minister, Mr. Ramsay MacDonald.

BATTLESHIPS AND AIR ATTACKS

The First Lord of the Admiralty, Sir Bolton Eyres Monsell, in the course of a speech to members of the Institution of Naval Architects on 10th April, made the following statement regarding the capabilities of the modern battleship to withstand air attacks :—

" In some quarters to-day it is fashionable to decry the battleship ; one of the chief arguments used is the contention that bombing from the air has made battleships obsolete, and the wildest assertions are made in this respect.

In 1921, the United States carried out some bombing experiments on an old German battleship, and only a short time ago a speaker in the House of Commons, referring to these experiments, gave the impression that it took only three minutes to sink the ship. In point of fact, the three minutes which the speaker described were the final three minutes of experiments lasting two days. On the first day, although a large number of heavy bombs were dropped and 13 hits registered, the hull was undamaged and the protective deck intact. The ship was eventually sunk on the second day, but it must be remembered she was a passive target, was old-fashioned, had insufficient deck protection, and no means of dealing with damage received.

A more interesting experiment was carried out by the United States in 1925 with the ' Washington,' which embodied the then latest ideas of underwater construction. The tests were conducted by placing bombs outside the ship, and at the most effective depth and distance to test the resistance of the hull. The Board which inquired into this and other experiments reported that after suffering the explosions of three under-water bombs of the largest size and two torpedo explosions also of the largest size directly against the hull, with no repair of leaks and no pumps going, the ' Washington ' remained afloat for four days and was finally sunk by gunfire. And as the result of the whole series of experiments the Board reported that the battleships had not been rendered obsolete by air attack.

THE GREEK REVOLT

Some very up-to-date evidence on the subject has been obtained from the recent revolt in the Greek Navy. An old cruiser, the ' Averoff,' which was completed in 1911, with no deck protection and two antiquated 3-in. A.A. guns, steamed slowly out of harbour on Friday afternoon, the 1st March, with what appears to have been a somewhat scratch crew. A modern trained Air Force went in pursuit from the same base on the following morning. The next day, Sunday, the 3rd March, there appeared in one of our enterprising newspapers a photograph of the ' Averoff ' with aircraft just over her funnels, and explosions taking place on her deck. This was a veritable triumph of ' film ' over ' fact.' On the Monday morning, we were being told that the rebel warships had been reduced to impotence. I have no doubt that the staff of those papers hailed the Greek revolt as a gift for the propaganda they were indulging in, but it is proverbially very necessary to be cautious in regard to gifts from the Greeks. The ' Averoff ' continued to go about unhampered and undamaged exactly where she wished.

Few people realize the great defensive power which even our old battleships have to-day against air attack. The battleship of the future will be a veritable fortress of defence.

I have stressed this particular aspect of ships because I regard it as of the highest importance. I ask for a proper perspective in this matter. One of the inherent disadvantages of democracy is its susceptibility to mass suggestion, but it would be a tragedy if a question of the highest technicality involving, as we think, the very ability of the British Navy successfully to defend this our Realm and Empire, should be judged by irresponsible and inaccurate suggestion.

I am sure that the battleship—not necessarily big ones—will remain the pivot upon which all our ships will perform their historic function of supplying the factories of these islands with raw material, of feeding our inhabitants, of keeping open the communications and intercommunications of the Empire, and of making a tremendous contribution towards the general tranquility of the world—by making a quarter of the globe safe and secure."

NAVY NOTES

GREAT BRITAIN

The Navy Estimates.

The Navy Estimates for the year 1935–36 were issued on 6th March. The net total is £60,050,000, which exceeds the net total for 1934 by £3,500,000.

Of this increase, £245,196 is required in order to make normal progress with new construction; there is a rise of £166,200 in the non-effective votes which is automatic; an increase of £535,000 in the expenditure on the Fleet Air Arm; and a rise of £2,553,604 in the provision for the maintenance of the fleet, which is due mainly to the cost of necessary large repairs and modernization of capital ships in view of the prolongation of their lives by the London Naval Treaty, and to expenditure involved in partially making good deficiences in defensive material, stores, and equipment.

The new construction programme consists of:—

Three cruisers ("Southampton," late "Minotaur" type).
One leader and eight destroyers.
Three submarines (one minelayer submarine, one "P" or general service, and one "S" or patrol type).
One submarine depot ship.
Four sloops (three minesweeping and one convoy sloop).
One surveying ship.
Seven small vessels (two coastal sloops, one small minelayer, two gate vessels, and two trawlers).

Provision is made for an increase of 2,144 in Vote A (numbers), the total being 94,482 as compared with 92,338. A substantial part of this is due to the replacement of old ships by new ships, including the cruisers of the 1931 and 1932 programmes, and to the expansion of the Fleet Air Arm, and the balance is required for meeting the growing needs of the existing fleet under modern conditions and for making good various deficiences in personnel.

The First Lord's Speech.

The Estimates were introduced in the House of Commons on 14th March. The following are points from the speech of Sir Bolton Eyres Monsell, the First Lord:—

Modernization.—We have lagged behind the other great Powers for a long time in the modernization of our capital ships. The United States have modernized ten of their fifteen ships at a cost of about £16,000,000, and we anticipate that Japan will have modernized the whole of her ships by the beginning of 1937. We have only modernized one ship. Modernization includes new engines and the necessary provision of anti-aircraft protection.

Fleet Air Arm.—Increased expenditure on the Fleet Air Arm includes £130,000 for new flights, an addition of nineteen first-line machines compared with twelve built last year—six for the "Glorious," six for capital ships, and seven for cruisers.

The rearmament programme involves £150,000, because the 39 first-line aircraft which we are providing are a new type, more expensive than those they are replacing.

Limitation.—We are anxious for an international agreement to reduce the size of all ships. We want capital ships of 25,000 tons and 12-in. guns, instead of 35,000 tons and 16-in. We want the 8-in. cruiser to disappear, and to isolate the 6-in. cruiser. We wish to reduce the size of all future cruisers to 7,000 tons with 6-in. guns; aircraft carriers to 22,000 tons, with 6-in. guns; and to abolish submarines altogether, or else drastically reduce their numbers and their type.

Navy and Air.—Six combined exercises with the Air Force were carried out in 1934, four at home and two in China. Next autumn, in order to test the suitability of aircraft carriers for taking part in home defence, we are going to exchange the pilots of a squadron of the Fleet Air Arm with those of a squadron of the Home Defence Air Force.

The Air gives the Navy not only a potent weapon but an increased range of vision, and our hitherto limited horizons have been swept back by many miles. The Navy cannot work without bases defended by the Army and Air Force. Neither can the Army or Air Force operate or transport themselves without the deep sea security which the Navy can give, and the Navy at present guarantees that mobility.

Standard of Strength.—Reductions since the War have had a very great cumulative effect. Comparing our ships in 1914 with the prospective number at the end of 1936, we find that capital ships have been reduced from 69 to 15, cruisers from 108 to 50, destroyers and similar craft from 322 to 118, and submarines from 74 to 48. If other countries are similarly compared it will be found that the United States increased by 20 per cent., Japan increased by 35 per cent., and this country reduced by 48 per cent.

H.R.H. The Duke of Gloucester.

H.M.A.S. "Australia," Captain W. S. F. Macleod, O.B.E., arrived at Portsmouth on 28th March from Jamaica with the Duke of Gloucester on board, on his return from a seven months' tour in Australia and New Zealand.

The following were among the promotions and appointments in the Royal Victorian Order announced in connection with the successful termination of the tour:—

C.V.O.—Captain S. S. Bonham-Carter, D.S.O., R.N., dated 21st November, 1934; and Captain W. S. F. Macleod, O.B.E., R.N., dated 28th March, 1935.

M.V.O., Fourth Class.—Commander G. E. Creasy, R.N., Lieutenant-Commander R. P. Mack, R.N., Commander (E) T. H. Simpson, R.N., Paymaster Commander M. G. S. Cull, O.B.E., R.N., Surgeon Commander A. W. Gunn, R.N., Major R. H. Quill, R.M., and the following officers of the Royal Australian Navy:—Commander H. B. Farncomb, Lieutenant-Commander C. C. Baldwin, Lieutenant-Commander J. H. Walker, Engineer Commander R. B. Smith, Paymaster Commander A. Freyer, and Surgeon Lieutenant-Commander L. Lockwood.

Flag Appointments.

Mediterranean Command.—The King has been pleased to approve the appointment of Admiral Sir A. Dudley P. R. Pound, K.C.B., to be Commander-in-Chief, Mediterranean, in succession to Admiral Sir William W. Fisher, K.C.B.,

C.V.O., to date 30th September, 1935, and to assume command at Malta about 30th October, 1935.

SECOND SEA LORD.—Vice-Admiral Sir Martin E. Dunbar-Nasmith, V.C., K.C.B., is to be a Lord Commissioner of the Admiralty and Chief of Naval Personnel, in succession to Admiral Sir Dudley Pound, to date 30th September. He will be appointed to the " President," additional, for duty inside Admiralty, to date 2nd September.

AFRICA COMMAND—The King has been pleased to approve the appointment of Rear-Admiral Francis L. Tottenham, C.B., C.B.E., to be Commander-in-Chief, Africa Station, in succession to Vice-Admiral Sir Edward R. G. R. Evans, K.C.B., D.S.O., to date 26th July, 1935, and to assume command about 9th September.

DEVONPORT DOCKYARD.—Rear-Admiral A. L. Snagge, C.B., succeeded Vice-Admiral H. O. Reinold, C.B., C.V.O., as Admiral-Superintendent, H.M. Dockyard, Devonport, on 2nd March, 1935.

THIRD CRUISER SQUADRON.—Rear-Admiral G. H. D'O. Lyon succeeded Rear-Admiral H. J. S. Brownrigg, C.B., D.S.O., as Rear-Admiral Commanding the Third Cruiser Squadron at Gibraltar, on 9th April, 1935.

COAST OF SCOTLAND.—Rear-Admiral R. C. Davenport is to be Rear-Admiral and Commanding Officer, Coast of Scotland, in succession to Rear-Admiral E. J. Hardman Jones, C.B., O.B.E., to date 15th July, 1935.

NAVAL REVIEW COMMANDS.—Rear-Admiral G. C. Dickens, C.B., C.M.G., is to be Rear-Admiral Commanding Tenth Cruiser Squadron, temporarily for the Jubilee Naval Review, and Rear-Admiral C. G. Ramsey to be Rear-Admiral (D) Commanding Reserve Fleet Destroyer Flotillas, temporarily for the Jubilee Naval Review, both to date 1st July, 1935.

FLAG LIST CHANGES.

Consequent on the vacancy on the Rear-Admirals' List caused by Rear-Admiral A. L. Snagge, C.B., becoming supernumerary to the List on appointment as Admiral-Superintendent, Devonport, on 2nd March, 1935, the following promotions and retirements were approved :—Captain Hugh T. England, A.D.C., to Rear-Admiral, to date 2nd March, and placed on the retired list, 3rd March ; Captain John A. Edgell, O B.E., A.D.C., to Rear-Admiral, to date 3rd March. Rear-Admiral Edgell will be supernumerary to the Rear-Admirals' List while holding the appointment of Hydrographer of the Navy, and in consequence Captain L. D. I. MacKinnon, A.D.C., is promoted to Rear-Admiral, to date 3rd March.

PERSONNEL.

RETIRED PAY OF LIEUTENANT-COMMANDERS.—On 28th March it was notified that the Board had had under consideration the question of extending the retired pay scale for executive officers, and had decided that Lieutenant-Commanders who had passed out of the zone for promotion to Commander and were at least 35 years of age might be permitted to apply to retire voluntarily with retired pay, notwithstanding that they had not reached the qualifying age of 40 laid down in the regulations for retirement with retired pay. The rate of retired pay for which they will be eligible will be a flat rate of £240 per annum, standard rate. Officers will not, either now or in future, be allowed to retire under this extended scheme unless their services can be spared without detriment to the Service.

BEAUFORT AND WHARTON TESTIMONIALS.—The Beaufort and Wharton Testimonials for 1934 have been awarded to Lieutenant G. W. McKendrick, R.N., of H.M.S. "Boadicea."

GOODENOUGH MEMORIAL PRIZE.—The Goodenough Memorial Prize for 1934 has been awarded to Acting Sub-Lieutenant R. E. Hutchins, R.N., of H.M.S. "Dryad." This officer is the first to be promoted from the lower deck who has gained this prize, for passing the best examination of his year in gunnery.

NAVAL HISTORY PRIZES.—The following officers have been awarded prizes as shown below on the result of the annual examination in naval history for the year 1934:—Lieutenant H. C. Fox, R.N., £50, medal, and certificate of merit; Lieutenant M. W. Tomkinson, R.N., £15 and certificate of merit; and Lieutenant R. D. Franks, £10 and certificate of merit.

OFFICERS' SWORD BELTS.—Their Lordships have approved a new pattern buckle for the officers' full dress and undress sword belts (other than those for flag officers). Patterns may be seen in the Admiralty Pattern Room, Queen Anne's Chambers, S.W.1.

FLEET ACCOUNTANT OFFICERS.—An Order in Council published in the *London Gazette* on 5th April provides that, in consideration of the prestige, status and responsibilities of their work, Paymaster Captains of less than three years' seniority holding appointments for the supervision of the accountant work of the Home and Mediterranean Fleets should receive an allowance of 4s. a day in addition to their full pay.

AFRIKAANS INTERPRETERS.—The Afrikaans language has been added to those in which officers may qualify as interpreters. An Order in Council of 21st February authorizes the appointment of one officer on the Africa Station who is so qualified, with an allowance of 2s. or 1s. a day according to the standard of qualification.

NEW CONSTRUCTION.

THE 1934 PROGRAMME.—The following contracts under this programme have been awarded since the last issue of the JOURNAL:—

Aircraft Carrier "Ark Royal," Messrs. Cammell Laird and Co., Ltd., Birkenhead.

Coastal Sloops ("Kingfisher" class), "Mallard" and "Puffin," Messrs. A. Stephen and Sons, Ltd., Govan.

Netlayer "Protector," Messrs. Yarrow and Co., Scotstoun.

Surveying Ship "Stork," Messrs. William Denny and Brothers, Dumbarton.

THE 1933 PROGRAMME.—The last of the five sloops of this programme to take the water was the "Speedwell," minesweeper sloop, which was launched by Messrs. W. Hamilton and Co., Ltd., Port Glasgow, on 21st March.

The first of the five to be completed was the "Enchantress," a new type of convoy sloop. She arrived at Portsmouth on 6th April from the Clydebank yard of John Brown and Co., Ltd. As she is to serve on occasion as Admiralty yacht, the "Enchantress," instead of the regulation grey, has been painted black, with white upper works and yellow funnels. Her three 4.7-in. guns are mounted forward. From amidships aft she has been adapted as a "yacht," and has a deck saloon with a promenade deck above it. From the rear of the saloon there is access to another small promenade deck or poop, and beneath the saloon is a dining room. There are cabins and bathrooms for the First Lord and First Sea Lord, and eight

other cabins. Furniture and plate from the old Admiralty yacht " Enchantress " is being transferred to the new vessel, which is expected to be used officially for the first time at the Jubilee Naval Review.

THE 1932 PROGRAMME.—The destroyers of this programme are being passed into service at various dates up to 6th June, and will relieve vessels of the 6th Destroyer Flotilla as follows :—Leader " Faulknor " to relieve the " Campbell " ; " Fearless ", " Valentine " ; " Fame ", " Westcott " ; " Firedrake ", " Walpole " ; " Foresight ", " Vidette " ; " Forester ", " Westminster " ; " Fortune ", " Vanquisher " ; " Foxhound ", " Wolfhound " ; and " Fury ", " Windsor."

EXERCISES AND CRUISES.

HOME FLEET.—The Home Fleet returned to its ports on 25th and 26th March from the Spring cruise and the combined exercises with the Mediterranean Fleet held from 8th to 15th March. The Fleet was to remain at its home ports for the commemoration of the King's Jubilee on 6th May, and to leave next day for the summer cruise, in the course of which it will visit Southend and the Thames from 15th to 22nd May.

MEDITERRANEAN FLEET.—On leaving Gibraltar on 7th April the " Queen Elizabeth," flagship of Admiral Sir William Fisher, K.C.B., C.V.O., accompanied by the destroyer " Basilisk," visited Toulon from 10th to 13th April. The " Delhi " and " Durban " were to remain at Gibraltar for the Jubilee celebrations, during which the " London " was due to visit Famagusta ; the " Devonshire ", Larnaca ; the " Shropshire ", Limasol ; and the " Despatch ", Haifa.

CHINA STATION.—The cruisers " Kent " and " Suffolk " and sloop " Falmouth " cruised in Japanese waters during April, visiting Yokohama, Hakodate, Nagasaki, Beppu, and Kobe. During Jubilee week the " Kent " was to be at Shanghai, the " Berwick " at Nanking, the " Cornwall " at Amoy, the " Capetown " at Chinwangtao, and the " Hermes," with destroyers and other craft, at Hong Kong.

AMERICA AND WEST INDIES.—By 6th April the cruisers on this station had assembled at Bermuda after their respective cruises. The flagship " York " had visited, in addition to British ports, Vera Cruz, Mexico, and Pensacola (Florida) during March. The " Danæ " visited at the same time Port Arthur, Texas ; St. Petersburg (Florida) ; and Charlestown, S.C. ; while the " Dragon " made calls at Galveston (Texas) ; Mobile (Alabama) ; and Havana. The " Exeter," with the Commodore, South American Division, returned on 14th March from the coasts of Chile and Peru.

AFRICA STATION.—The Commander-in-Chief, in the sloop " Milford," made a cruise to Walvis and Luderitz in the latter part of January. The " Carlisle " acted as flagship until the arrival of the "Amphion " ; she was to be at Capetown from 4th to 27th May. The sloop " Weston " cruised on the West Coast.

CADET CRUISER.—The " Frobisher " left Chatham on 11th January for the West Indies. On 21st January she answered the S.O.S. of the Glasgow tanker " Valverda " on fire, 1,250 miles East of the coast of Florida. When the weather moderated the cruiser took her in tow for Bermuda, and reached there, a distance of 880 miles, on 1st February.

BATTLE-CRUSIER SQUADRON COURTS-MARTIAL.

Arising out of the collision between H.M. Ships " Hood " and " Renown " on 23rd January off the coast of Spain, courts-martial were held at Portsmouth

on 26th, 27th, and 28th of February. At the first Court, presided over by Vice-Admiral E. A. Astley-Rushton, C.B., C.M.G., Rear-Admiral S. R. Bailey, C.B., C.B.E., D.S.O., commanding the Battle-Cruiser Squadron, was acquitted of a charge of negligence or default in hazarding the two ships. At the second Court, presided over by Rear-Admiral C. G. Ramsey, Captain H. R. Sawbridge, O.B.E., commanding H.M.S. " Renown," was found guilty of hazarding his ship, and was sentenced to be dismissed his ship. At the third Court, presided over by Rear-Admiral F. L. Tottenham, C.B., C.B.E., Captain F. T. B. Tower, O.B.E., commanding H.M.S. " Hood," was acquitted of a charge of hazarding his ship.

On 19th March, the Secretary of the Admiralty announced that the Board of Admiralty had reviewed the proceedings of the courts-martial. After a careful examination of the evidence adduced, their Lordships reached the following decisions. They dissent from the finding of the court-martial held for the trial of Rear-Admiral Bailey to the following extent. Rear-Admiral Bailey adopted an unusual procedure in directing H.M. Ships " Hood " and " Renown " to steer definite courses to close. Since he had given that order, responsibility for the manœuvre rested on him, and it was incumbent on him at the proper moment to make a further signal to reform his Squadron. His not doing so left in doubt his final intention. The signal for the " Hood " and " Renown " to form single line ahead was made too late. For these reasons their Lordships are unable to absolve Rear-Admiral Bailey from all blame.

Their Lordships agree in the finding of the court-martial held for the trial of Captain Sawbridge, but they have decided to reduce the sentence to a severe reprimand. Captain Sawbridge will, therefore, resume command of H.M.S. " Renown."

Their Lordships consider that Captain Tower should have taken avoiding action earlier and to that extent they are unable to acquit him of all blame.

Miscellaneous.

Persian Gulf Naval Stations.—On 2nd April, it was announced at Delhi that the British naval stations on the Persian side of the Persian Gulf, Hanjam and Basidu, were to be transferred to the Arabian side, to Bahrein, with the concurrence of the Sheikh of Bahrein. This move from North to South is prompted by the transfer of the England-India air route to the Arabian side.

Namesake of H.M.S. " Orion."—To celebrate the launching of the R.M.S. " Orion " on 7th December, 1934, the Captain and officers of H.M.S. " Orion " presented to her a coloured print of the cruiser. The owners of the " Orion " have now returned the compliment by presenting to the Captain and wardroom officers of H.M.S. " Orion " a handsome silver salver, inscribed with the crest common to both ships.

Presentation.—On 29th March, Admiral Sir Frederic Dreyer presented to H.M.S. " Suffolk " a piece of silver plate on behalf of Ellerman's City Line in appreciation of the rescue by that cruiser of the crew of the ss. " City of Cambridge " off Pratas Island in October last.

THE FLEET AIR ARM.

Rating Observers.—Air Ministry Orders issued on 21st March contained the programme of instructional courses for officers, airman pilots, and air gunners, including a new course which will begin on 15th July at the R.A.F. School of Naval

Co-operation, Lee-on-the-Solent, for naval ratings to qualify as Observers' Mates. There will be nine vacancies and the course will last 22 weeks. This will be the first time that ratings have been accepted as Observers in the Fleet Air Arm.

MEDITERRANEAN TRAINING.—The "Courageous" and "Furious," the former flying the flag of the Rear-Admiral, Aircraft Carriers, arrived at Malta on 18th January, and worked with the Mediterranean Fleet until the combined exercises in March, when they rejoined the Home Fleet. The "Eagle" arrived at Malta from China on 30th January. She took part in the combined exercises, and left Gibraltar for home on 31st March, to reduce to reserve. The "Glorious," after completing large repairs about the end of July, will return to the Mediterranean.

CATAPULTS.—There are now 26 capital ships and cruisers fitted with catapults, and 33 aircraft are allocated to them. In addition, H.M.S. "Nelson," without a catapult, has one of the new small amphibian flying boats, which is hoisted in and out by a crane.

ROYAL MARINES.

STRENGTH.—The number of officers and other ranks authorized in the Navy Estimates, 1935, for the Royal Marines is 9,835, as compared with 9,526 in 1934. There is an increase of ten in the number of commissioned officers—392 as against 382.

UNIVERSITY COMMISSIONS.—Arrangements have been made with certain of the principal Universities for the nomination of graduates for commissions in the Royal Marines. A limited number of commissions will be offered annually to such candidates.

ROYAL NAVAL RESERVE.

Captain Ernest Edkin, O.B.E., R.D., has been appointed a Royal Naval Reserve Aide-de-Camp to the King from 1st March, 1935, in succession to Captain Richard Harrison, D.S.O., R.D., who vacated the appointment on completing three years' service.

The vote for the Royal Naval Reserve in the new Estimates is increased from £129,770 to £139,600. The average bearing during the year is expected to be:—Executive officers, 1,048; skippers and officers promoted therefrom, 239; engineer officers, 43; commissioned and warrant engineers, 24; accountant officers (excluding registrars), 200.

As an encouragement to keenness and efficiency in the R.N.R., their Lordships have approved of the institution of good service badges for ratings after four, eight, and twelve years service. The badges will be unpaid and conferred gratuitously.

ROYAL NAVAL VOLUNTEER RESERVE.

The sloop "Laburnum" arrived from New Zealand at Singapore on 30th March, and was accepted by the Straits Settlements Government as a drill ship to be stationed at Signapore. Commander L. A. W. Johnson, M.V.O., R.N., retired, has been appointed Commanding Officer and Instructor to the new force.

There are now R.N.V.R. Divisions in Australia, Canada, New Zealand, South Africa, Kenya, Hong Kong, and Singapore. The generosity of Sheik Ali bin Salim, K.B.E., who has given £1,200 for the purpose, has made it possible to provide the Kenya R.N.V.R. with permanent headquarters.

H.M.S. "Curacoa" made the customary Easter cruise from 18th to 22nd April or the training of R.N.V.R. officers and men. She visited Torbay and Guernsey, and 6-in. full calibre firing was carried out.

DOMINION NAVIES

ROYAL AUSTRALIAN NAVY.

INCREASED ESTIMATES.—The Estimates for 1935–36 amount to £1,886,746, as compared with £1,603,583 for the previous year. Provision is made for an increase in the personnel from 3,250 to 4,100, the increase including 38 more officers. Two new sloops are to be built at Cockatoo Island Dockyard, Sydney—the "Yarra" and the "Swan."

NEW CRUISER.—The "Brisbane" commissioned on 2nd April at Sydney for passage to England, and was due to leave on 2nd May, arriving at Portsmouth on 9th July. She will bring a crew for the new cruiser "Sydney," which should be completed on the Tyne on 24th September to join the Australian Fleet. On arrival in the United Kingdom, the "Brisbane" will cease to be a unit of the R.A.N., and will be prepared for disposal. She was completed in 1916.

VISIT TO NEW ZEALAND.—The Australian Squadron under Rear-Admiral W. T. R. Ford visited New Zealand waters during March. The "Canberra" and "Sussex" arrived at Auckland on 13th March and the destroyers "Stuart," "Voyager" and "Vendetta" on 14th March. On the 23rd, the ships arrived at Wellington. Lyttleton, Port Chalmers, and New Plymouth were also visited by individual ships.

ROYAL CANADIAN NAVY.

ACTING CAPTAIN (D).—Commander R. I. Agnew, R.C.N., commanding the Eastern Sub-Division in H.M.C.S. "Saguenay," was appointed Acting Captain (D), Canadian Division, from the date the Western Sub-Division joined the Eastern Sub-Division early in February until the day after the former parted company in April. The Division arrived at Bermuda on 26th March. The "Skeena" and "Vancouver" left there on 8th April for Jamaica, the Canal Zone, Manzanillo, San Francisco and Esquimalt. The "Saguenay" and "Champlain" left on 17th April for Miami, Philadelphia, St. John, N.B., and Halifax.

FOREIGN NAVIES

CHINA.

BRITISH ADVISER.—Captain J. A. V. Morse, D.S.O., R.N., late of the Operations Division, Naval Staff, Admiralty, has been appointed Head of the British Mission which since 1930 has been assisting in the reorganization and modernization of the Chinese Navy.

HIGH-SPEED PATROL BOAT.—On 5th March, the small high-speed motor-boat "Kuan Wei," built for the suppression of smuggling and piracy on the coast of China, was tried in Southampton Water. The craft has been constructed by the Power Boat Company, of Hythe, Southampton. It is 45 ft. long, with a draught of 2 ft. 4 in., and is protected by armour plating. Four Lewis guns, a number of rifles, 1½ tons of petrol, half a ton of fresh water, and three-quarters of a ton of food, kit, and gear can be carried

FRANCE.

NAVAL ESTIMATES.—The Doumergue Government cut down the Naval Estimates for 1934 by 63 million francs. In July of that year, however, certain non-recurrent

expenditure was approved to be paid out of a special credit of 865 million francs, to be spread over a period of years. This makes provision for :—

(*a*) 595 million francs for oil reserves ;
(*b*) 80 million francs for coast defence works ;
(*c*) 190 million francs for the re-equipment of the Aeronautique Maritime.

The Naval Estimates for 1935 amount to 2,903,479,543 francs, which is an increase of over 24 million francs on the revised 1934 estimates.

HIGHER COMMANDS.—With the exception of Vice-Admiral Durand-Viel, Chief of the Naval Staff, and Vice-Admiral Morris, Assistant Chief of the Naval Staff, most of the high commands were changed during 1934. The First Squadron (Mediterranean) is now commanded by Vice-Admiral Mouget, the Second Squadron (Atlantic) by Vice-Admiral Darlan, the Levant Division by Rear-Admiral Rivet, the Far Eastern Division by Rear-Admiral Richard, and the Third Light Division by Rear-Admiral Gensoul.

NEW CONSTRUCTION.—During 1934 the following new construction was completed : one 10,000 ton cruiser, " Algérie " ; four flotilla leaders ; four first class submarines ; six second class submarines ; two colonial sloops ; two gunboats.

The following were under construction or on trials during the year :—one battleship, " Dunkerque " ; six cruisers ; one mine-laying cruiser ; one net-layer ; six flotilla leaders ; eight first class submarines ; five second class submarines ; onee colonial sloop ; six *escorteurs*.

In addition there were laid down one battleship, " Strasbourg " ; two flotilla leaders ; six *escorteurs*.

NEW BATTLESHIPS.—On 25th March, the Chamber approved laying down this year one 35,000-ton capital ship and two 1,700-ton destroyers, and that a second 35,000-ton vessel should be laid down after the end of 1936.

In the discussion it was stated that the personnel of the French Navy now consisted of 57,000 men, of whom only 6,400 were conscripts.

THE " DUNKERQUE " CLASS.—Of the two 26,500-ton battleships building, the " Dunkerque " (laid down 1932) and " Strasbourg " (laid down 1934), the former is due to be floated out at Brest early in July. This vessel is being bult in two sections, the fore part in La Ninon dock and the after part in Le Salou dock. This is believed to be the first time that a large war vessel has been built in such a manner.

GERMANY.

OVERSEA CRUISE.—The cruiser " Karlsruhe " in the course of a foreign cruise visited Vancouver in March. This was stated to be the first time that German uniforms had been worn on Canadian soil since before the War.

(See also International Situation, p. 407)

ITALY.

NAVAL ESTIMATES.—Naval expenditure for 1934–35 is reduced by about 1,725,000 lire as compared with the previous year, the saving being mostly at the expense of new construction.

NEW CONSTRUCTION.—During the past year four destroyers and twelve submarines have been added to the fleet. In the early part of the year Signor Mussolini announced that it was the policy to build up to the full tonnage allowed by the

Washington Treaty, for which 1 milliard lire would be allotted, expenditure being spread over six years.

At the end of 1934 the following were under construction: two 35,000-ton battleships; four 7,000-ton cruisers; two 5,000-ton cruisers; six 600-ton torpedo boats; one 340-ton submarine chaser; four 1,300-ton submarines; two 862-ton submarines.

BATTLESHIP RECONSTRUCTION.—The battleship "Giulio Cesare" and "Conte di Cavour," laid down in 1910 and completed in 1914 and 1915, have undergone reconstruction. Substantial alterations have been made to the propelling machinery and protection. The designed speed has, it is understood, been increased from 22 to 26 knots.

CONSCRIPTS RETAINED.—It was officially announced on 10th April that, beginning with the April group, the men of the 1913 class serving in the Navy who were due for discharge were to be retained in the Service. This will not affect the calling up in their proper groups of the 1915 class. An intention to maintain the navy on a stronger footing is indicated, as has already been done in the case of the army.

CRUISERS LAUNCHED.—The cruiser "Eugenio di Savoia" was launched at the yard of the Ansaldo Company at Genoa on 16th March. This made a total of four ships of the "Condottieri" type to be launched within twelve months, and a total of ten altogether. These vessels are armed with eight 6-in. guns, and are designed for 36½ or 37 knots—the fastest designed speed of any cruisers in the world at present, so far as official information shows.

SUBMARINES LAUNCHED.—On 31st March, there were launched the submarines "Pietro Calvi," at Spezia, and the "Pietro Micca" at Taranto. The former is of 1,332 tons, 17 knots, two 4.7-in. guns and eight tubes; the latter (a minelayer) of 1,371 tons, 15½ knots, two 4.7-in. guns and six tubes.

JAPAN.

THE MANDATED ISLANDS.—Admiral Suyetsugu, late Commander-in-Chief of the Japanese Combined Fleet, in an article published in the *Nichi Nichi* in January, and quoted by the Tokyo correspondent of *The Times*, wrote as follows:—

> "The mandated islands are Japan's first line of marine defence. . . . As long as Japan is able to hold these isles her national safety is secured. A peculiar feature is that Japan's possession of the isles does not menace any Power, the isles being too far away from other countries. Supposing, however, that they should come into the possession of a foreign Power, or be occupied by an enemy nation, they would at once endanger Japan's defence. An enemy fleet would then be enabled easily to cruise in Far Eastern waters, making these islands bases. Besides, these isles are naturally-built aircraft carriers, and would afford the enemy air squadrons ideal places from which to operate. These islands are apparently made to order for Japan. In fact, the Pacific equilibrium can be maintained only when Japan holds them.

TRAINING CRUISE.—A Training Squadron consisting of the cruisers "Asama" and "Yakumo," the former flying the flag of Rear-Admiral Nakamura, visited Bangkok and Singapore in March. Three Japanese Princes were serving in the squadron. The vessels arrived at Fremantle, Western Australia, on 13th April.

POLAND.

NEW DESTROYER CONTRACT.—In March, an order for building two 2,000-ton destroyers was placed with Messrs. J. S. White and Co., Ltd., of Cowes. This is the first contract for combatant vessels placed by Poland in Great Britain. The only two post-War destroyers in her navy were built in France.

ADMIRAL'S VISIT TO ENGLAND.—Admiral J. Swirski, head of the Naval Department of the Polish Ministry of Defence and Commander-in-Chief of the Polish Fleet and River Flotillas, arrived in London on 5th April to study British methods of naval construction. During a visit to Cowes on 11th April he inspected H.M.S. "Fury," then undergoing her trials.

PORTUGAL.

NEW SHIPS DELIVERED.—On 7th March, amid scenes of great enthusiasm, the sloop "Afonso de Albuquerque" and submarine "Espadarte" arrived in the Tagus on being completed for the Portuguese Navy in British shipyards.

NEW PROGRAMME.—On 9th March, it was announced at Lisbon that tenders were to be invited for the construction of five destroyers and three submarines for the Portuguese Navy. The vessels are to be delivered before the end of 1939, and form the second part of the building programme. Of the 14 ships in the first part, nine were built in British shipyards and three in Lisbon private yards under the supervision of British engineers.

SPAIN.

NEW PROGRAMME.—On 13th March the Minister of Marine introduced a Bill in the Cortes providing for the expenditure of about £13,000,000 for the provision of vessels considered necessary for the defence of the Balearic Islands. These include ten submarines of 400 tons, twelve torpedo boats of 800 tons, twelve motor boats of 200 tons, twelve fast torpedo launches of 50 tons, eight minesweepers, three tugs, and two minelayers. Expenditure would be spread over five years.

UNITED STATES.

RECORD NAVAL BUDGET.—A naval budget of £93,057, 252—a record for peacetime, was favourably reported to the House of Representatives by the Appropriations Committee on 23rd April. The proposed expenditure for the fiscal year 1935–36 exceeds that of the current year's estimates by over £34,000,000.

A recommendation was made that the new building programme of 24 vessels should be halved, with a proviso that work on them can be begun later if the Naval Conference fails. Provision is included for 555 new naval aircraft, of which 282 are replacements and 273 additions to the present force of 1,193 aircraft.

The Assistant Secretary of the Navy, Mr. H. L. Roosevelt, informed the committee that the Navy proposes to operate during the coming fiscal year 321 ships and 920 aircraft, as compared with 306 ships and 760 aircraft during the current year.

COMMAND CHANGES.—Rear-Admiral O. G. Murfin, from Battleship Division 3, has been appointed Commander-in-Chief, Asiatic Fleet, with the rank of Admiral. Vice-Admiral Harris Laning, from the Cruiser Command, becomes Commander of the Battle Force with the rank of Admiral. Rear-Admiral A. J. Hepburn, from the command of Destroyers, Battle Force, is appointed Commander of the Scouting Force, with the rank of Vice-Admiral. Rear-Admiral W. T. Cluverius, from the

command of the Ninth Naval District, becomes Commander of the Base Force. Rear-Admiral W. D. Leahy, Chief of the Bureau of Navigation, is appointed Commander of the Battleship Divisions, with the rank of Vice-Admiral. Rear-Admiral C. H. Woodward, from the General Board, becomes Commander of the Destroyers, Battle Force, and Rear-Admiral Sinclair Gannon, from the command of Minecraft, Commander of the Destroyers, Scouting Force.

In view of the increasing importance of aircraft in the Fleet, the officer commanding Aircraft, Battle Force, will be a Vice-Admiral. Rear-Admiral H. V. Butler, who has been Commander, Aircraft Battle Force, and also Commander, Aircraft, U.S. Fleet, since June, 1934, will receive the Vice-Admiralcy now held by one of the Commanders, Cruisers, Scouting Force. With the Fleet concentrated, it is stated, there is no need for two Vice-Admirals in the Scouting Force.

Fleet for Manœuvres.—Plans for the manœuvres from 3rd May to 10th June show that the theatre of operations will be the largest ever known, a matter of about 5,000,000 square miles. It is bounded on the North by the Aleutian Islands, on the South by the Tropic of Cancer, on the East by the mainland of the United States, and on the West by Midway Island, 1,200 miles West of Honolulu.

A total of 177 ships and 447 aircraft is taking part, under the command of Admiral Joseph M. Reeves, Commander-in-Chief of the U.S. Fleet.

Personnel.—Provision has been made for the following increases in personnel: 165 naval officers; 51 officers for the Marine Corps; 435 Midshipmen at the Naval Academy; 1,000 enlisted men.

The latter figure will bring the strength of the enlisted personnel from 82,500 on the 1st July, 1935, up to 93,500 at the close of the fiscal year 1936. This increase is necessary to man the new ships, to augment the complements of larger existing vessels, and to meet the increased requirements of the Naval Air Arm.

Naval Air Service.

The Pacific Islands.—The three small Pacific islands—Wake Island, Kingman Reed, and Johnson-and-Sand Island—lying South and West of Hawaii, were on 20th January placed under the control and jurisdiction of the U.S. Naval authorities by an executive order from the White House. In the middle of March the U.S.S. "Nitro," with one amphibian aircraft, called at Wake Island en route from Guam to Honolulu to conduct a brief hydrographic survey of the lagoon and terrain of the island, to ascertain its possible use in connection with future trans-Pacific flights.

Loss of the "Macon."—The Navy airship "Macon" was lost at sea on 12th February in the Pacific, near Point Sur lighthouse, California. Fortunately there were only two deaths, 81 members of the crew being rescued after they had taken to rubber lifeboats. The airship was reported to have nosed abruptly skyward, and Lieutenant-Commander H. V. Wiley (a survivor of the loss of the airship "Akron") was unable to bring her under control. He reported his position by wireless and announced his intention to abandon ship as soon as she struck water. Cruisers in the vicinity picked up the crew, the two who were lost being a radio telegraphist who is thought to have broken his back when jumping into the sea from 125 ft., and a Filipino messboy.

Mr. Swanson, Secretary for the Navy, has stated his intention of opposing further construction of navy dirigibles. He is of opinion that airships may be useful for commercial but not for military purposes.

ARMY NOTES

HOME

Army Estimates.

The Army Estimates for 1935 stand at the figure of £43,550,000; they are, therefore, higher by £3,950,000 than those for 1934.

The reasons of high policy which have led H.M. Government to take stock of the position of the Defence Forces of the Crown need not be recapitulated here save in so far as they affect the Military Forces.[1] The progressive diminution of the provision made for the Army in recent years will be apparent from the subjoined table. The present Army Estimates are still nearly £1,000,000 less than they were ten years ago, and the comparative figures for Vote A are 152,200 for 1935 and 156,600 for 1925.

If the Army is to be prepared to fulfil its defensive role, much work and considerable expenditure will be involved in bringing it up to modern standards of efficiency. The installation and improvement of coast defences at home and abroad and the necessary expansion of anti-aircraft defences are matters of pressing importance. The mobile forces of the Regular and the Territorial Armies require more modern arms and equipment; the programme of mechanization calls for acceleration; the reserves of stores and ammunition need to be augmented; modern methods of transport and communication have to be adapted for military purposes.

In the deliberate judgment of the Government the time has now arrived when action should be taken to bring our military preparations more up to date, and provision is included in these Estimates for expenditure on matériel and for some increase in numbers as an instalment of a programme which will necessarily spread over a series of years. Owing to financial stringency there are considerable arrears to be caught up in the improvement and modernization of barrack accommodation, which is still regrettably below civilian standards in many stations.

Attention has also to be paid to the more intensive training of both Regular and Territorial Armies; the former has its world-wide commitments as an Imperial Police Force and has to be prepared for any more serious emergency that may arise; the latter, as our Second Line Army, has special obligations in the spheres of coast defence and anti-aircraft defence.

The subjoined table gives comparative figures of the Army Estimates since 1930:—

Year.	*Effective charges.*	*Non-effective charges.*	*War terminal charges.*	*Total.*
	£	£	£	£
1930 . .	32,119,670	8,383,000	*Cr.* 2,670	40,500,000
1931 . .	31,528,350	8,750,000	*Cr.* 348,350	39,930,000
1932 . .	28,172,060	8,306,000	9,940	36,488,000
1933 . .	29,726,000	8,224,000	—	37,950,000
1934 . .	31,418,000	8,182,000	—	39,600,000
1935 . .	35,267,000	8,283,000	—	43,550,000

[1] See General Service Notes, p. 415.

ESTABLISHMENT AND DISTRIBUTION.—The total of Vote A is 152,200 as compared with 149,500 in 1934, but the distribution of the principal units of the Army remains generally the same.

The Coast Defence Garrisons of certain defended ports abroad have been under examination with a view to bringing their establishments into line with modern conditions, and a considerable portion of the increases now proposed is due to the progressive development of the anti-aircraft defences in these ports.

In continuation of the scheme under which the Territorial Army becomes responsible for land coastal defences at home, four regular Royal Engineer Fortress Companies have been dispensed with.

In the place of the separate unit known as the R.E. (Militia) Malta Division, it has been decided to introduce a Maltese Section into the regular Fortress Company at Malta.

Owing to the continued progress in mechanization there will be a fall of 1,820 in the establishment of horses.

STRENGTH AND RECRUITING.—The strength of the Regular Army, inclusive of British troops in India, on 1st April will be approximately 3,300 below the recruiting establishment; the number of men leaving the Colours during the year will be some 3,300 less than the anticipated intake of recruits.

Recruiting for the Regular Army showed a steady decline during April to November last, but there has since been a gradual improvement, which should to some extent redress the balance. It is satisfactory to record that the educational and moral standards of recruits enlisted have been maintained.

Advantages are now beginning to accrue from the recent reorganization of the recruiting services; steps are being taken further to increase the efficiency of the recruiting machinery by the appointment of an Inspector of Recruiting.

ARMY AND SUPPLEMENTARY RESERVES.—The strength of the Army Reserve at the beginning of the financial year will be about 111,500, and should rise to about 113,000 by the end of the year.

Recruiting for the Supplementary Reserve has been rather disappointing, but it is hoped that the strength will rise from about 20,600 at the beginning to approximately 22,000 at the end of the year.

VOCATIONAL TRAINING AND CIVIL EMPLOYMENT.—During the year ended 30th September last, 2,536 soldiers completed training at the Army Vocational Training Centres, of whom 2,198 or 86.6 per cent. are known to have obtained employment; the corresponding figures for 1934 were 2,340 and 1,997 or 85.3 per cent. There is every indication that the benefits of Vocational Training leading to increased possibilities of employment in civil life are becoming yearly more appreciated throughout the Army.

The procedure inaugurated in 1933, under which all soldiers are registered with the Employment Exchanges, continues to fulfil all expectations.

HEALTH OF THE ARMY.—The health of the Army throughout the year was very satisfactory. Influenza was much less prevalent than during the preceding year, and there was no undue incidence of any other disease.

There are at present 27,750 enrolled and efficient members of Voluntary Aid Detachments, of which number 6,390 have signed a "mobile" obligation. The corresponding figures for last year were 27,000 and 6,250.

DISCIPLINE.—The discipline of the Army continues to be maintained at a high standard. While the average regimental strength of other ranks of the Army shows an increase, there has been a reduction in the number of trials by court-martial during the year ended 30th September last as compared with the previous two years :—

Year.	*Average regimental strength.*	*Number of trials.*
1932	180,866	2,059
1933	183,318	1.938
1934	184,032	1,903

The figures for 1934 are of considerable interest, because in 1933 arrangements were made whereby magistrates were invited to hand over to the Military Authorities soldiers who had committed minor civil offences with a view to obtaining their discharge from the Army, and consequently an increase in the number of Courts-Martial might have been anticipated ; it is gratifying to note that this has not occurred.

The number of discharges for all causes of misconduct has fallen from 951 in 1932 to 706 in 1934, and the average daily number under sentence from 250 to 235.

TERRITORIAL ARMY.—The strength of the Territorial Army (exclusive of Permanent Staff) on 1st January, 1935, was 7,030 officers and 123,458 other ranks, an increase of 15 officers but a decrease of 2,263 other ranks in the twelve months. The number of recruits in the year ended September, 1934, was 24,821 as against 32,668 in the previous year, a decrease of 7,847, which can be partly accounted for by the fact that recruiting in 1933 was above the average, due to the revival of Camps in that year. Camps were again well attended, 6,025 officers and 107,365 other ranks being present out of a strength of 6,889 officers and 126,871 other ranks ; the percentage of attendance for all ranks was 84.76.

The Territorial Army is still much below its establishment, but, as a result of the discussions at the recent Staff College conference, provision is being made for various concessions which will provide certain financial benefits and will, it is hoped, result in improved recruiting.

In order to achieve a closer approximation to War Establishments, it is proposed to increase the Peace Establishment of Infantry Battalions by five officers, of Artillery Brigades by one or two officers, and of Yeomanry Regiments by one officer. The total increase involved is 963, of whom 200 are expected to be obtained in the current year.

The recent decisions of the Government to authorize an increase in the Royal Air Force in order to provide more adequate defence in the air against the possibility of aircraft attack will have consequential effects on the Territorial Army, which is to be charged with the ground defences against aircraft attack. These ground defences will have to be increased in order to ensure the proper co-ordination of the two forces.

TRAINING.—The scope of higher collective training at home during 1934 was considerably curtailed owing to the abnormal drought. In the current year it is intended to go further as regards higher training and to exercise the commanders and staffs of two corps. The programme which involves the application of the Manœuvres Acts to parts of Sussex, Hampshire and Wiltshire, is as follows :—
(i) The 1st, 2nd and 4th Divisions and the 1st Cavalry Brigade will carry out

brigade and divisional training concurrently within the manœuvre area and the adjoining area of the Aldershot Command. (ii) The 3rd Division, the 2nd Cavalry Brigade and the 1st Tank Brigade will carry out brigade and divisional training on Salisbury Plain. (iii) A War Office Exercise will be conducted at the end of other training, in which a corps of two divisions on each side will oppose one other, with units of the 1st and 2nd Cavalry Brigades and the 1st Tank Brigade, and contingents of Territorial Army troops participating. (iv) The 5th Division will train at Catterick.

WORKS SERVICES.—Provision is continued for a further instalment of the programme, spread over the next 15 or 20 years, of replacement of obsolescent huts at Bordon, Blackdown, Deepcut, Longmoor, Bulford, Shorncliffe, Strensall, Crownhill (Plymouth), Perham Down and in Egypt. Before the end of this period huts which have been improved so as to give them some 15 years of further usefulness at, e.g., Catterick, Larkhill, Ballykinlar, Bovington and Lulworth, will themselves need to be replaced.

The modernization of the older types of married soldiers' quarters which fall far short of present-day civilian housing standards and of existing barracks, many of which are over 100 years old, proceeds as financial circumstances permit, priority being given to the improvement of sanitation and of cooking, dining and institute accommodation. Progress will be made on barracks for a Tank Battalion at Perham Down, and barracks for two Tank Battalions at Warminster and a Royal Field Artillery Brigade at Redford and a Scottish Command Hospital at Redford will be commenced. Provision is also made for further accommodation required at Hong Kong and in Malta.

The policy of mechanization involves increased garage accommodation in various Commands, the erection or enlargement of Ordnance Workshops at Aldershot, Colchester, Tidworth and in Egypt, and the formation of a vehicle reserve depot at Chilwell.

The construction of married quarters for officers and other ranks at Jerusalem and Haifa will be begun and, to accommodate the garrison in Cyprus, a beginning will be made with the provision of new permanent barracks at Nicosia to take the place of the present dilapidated huts at Polymedia.

Provision is made for progress in connection with the defences of the Naval Base at Singapore and in adapting various Coast Defences to modern requirements.

ARMAMENTS AND RESEARCH.—In addition to the modernization of Coast Defences and the improvement of defences against attack from the air, substantial advances will be made in mechanization. The mechanization of horse artillery and of Army field artillery and the conversion of light artillery brigades into Army field brigades, which will be re-armed with the 4.5-in. howitzer and the 18-pr., will continue.

Considerable progress will be made in the provision of light dragons and light tanks of the latest types, both of which are of satisfactory design. As regards wheeled vehicles, successful trials of commercial vehicles fitted both with petrol and compression-ignition engines which are capable of carrying a military load, have made it possible to contemplate their use in war in aid of the requirements of 6-wheeled vehicles, the supply of which from commercial sources is very meagre. The recent improvement of the cross-country performance of the 4-wheeled vehicle has been remarkable, and every advantage is being taken of commercial development so as to restrict the number of special vehicles which must be held in peace.

Further issues of 3-inch mortars will be made to the Infantry, and the manufacture of a new light machine gun to replace the Lewis gun will begin.

In the field of research attention is being given to improved methods for prolonging the life of explosives, general stores such as tentage, wooden floors and metallic surfaces liable to rust or corrosion. Radiology is being employed with increasing success in testing the soundness of metals and the efficiency of welds and riveting. Important progress has been made in the application of wireless telegraphy and telephony to military problems.

Appointments and Promotions.

H.M. the King has approved of the following appointments :—

Colonel A. E. Davidson, D.S.O., to be Aide-de-Camp to the King, in succession to Colonel (temporary Brigadier) H. St. J. L. Winterbotham, C.B., C.M.G., D.S.O., retired ; Colonel A. K. Main, D.S.O., to be Aide-de-Camp to the King, in succession to Colonel (temporary Brigadier) V. M. C. Napier, C.M.G., D.S.O., retired ; Colonel (temporary Brigadier) H. N. North, D.S.O., to be Aide-de-Camp to the King, in succession to Colonel E. M. S. Charles, C.M.G., D.S.O., retired ; Colonel (temporary Brigadier) F. B. Hurndall, M.C., to be Aide-de-Camp to the King, in succession to Colonel G. F. H. Brooke, D.S.O., M.C.

H.R.H. The Duke of Kent, Earl of St. Andrews, and Baron Downpatrick, K.G., G.C.M.G., G.C.V.O., to be Colonel-in-Chief, The Queen's Own Royal West Kent Regiment.

Major-General A. A. McHardy, C.B., C.M.G., D.S.O., to be Colonel Commandant, Royal Artillery, in succession to the late General Sir H. M. Leslie Rundle, G.C.B., G.C.M.G., G.C.V.O., D.S.O.

Major-General G. G. Loch, C.B., C.M.G., C.B.E., D.S.O., to be Colonel, The Royal Scots (The Royal Regiment), in succession to Lieutenant-General Sir Edward A. Altham, K.C.B., K.C.I.E., C.M.G., who has resigned the appointment.

Major-General G. W. Howard, C.B., C.M.G., D.S.O., to be Colonel, The Essex Regiment, in succession to the late Major-General J. C. Harding Newman, C.B., C.M.G.

Major-General W. K. Tarver, C.B., C.M.G., as Colonel Commandant, Royal Army Service Corps, in succession to Major-General P. E. F. Hobbs, C.B., C.M.G., who has attained the age limit for the appointment.

Lieutenant-Colonel J. M. Weddell, F.R.C.S., Royal Army Medical Corps, to be Honorary Surgeon to the King (and promoted to the rank of Brevet Colonel), in succession to Colonel A. C. H. Gray, O.B.E., M.B., who has retired.

The following appointments have been announced :—

Major-General W. J. N. Cooke-Collis, C.B., C.M.G., D.S.O., to be General Officer Commanding, Northern Ireland District, with effect from 17th September next, in succession to Major-General E. S. Girdwood, C.B., C.M.G., Colonel, The Cameronians.

Colonel J. U. Hope, D.S.O., to be Commandant, Chemical Defence Experimental Station, Porton, with effect from 19th September next.

Lieutenant-Colonel R. H. R. Parminter, D.S.O., M.C., The Manchester Regiment, has been appointed Commandant, Royal Military School of Music and Inspector of Army Bands.

The following promotions have been made :—

Lieutenant-General Sir George D. Jeffreys, K.C.B., K.C.V.O., C.M.S., to be General.

Major-General J. E. S. Brind, C.B., C.M.G., D.S.O., to be Lieutenant-General.

Colonel T. Blakiston-Houston, D.S.O. ; Colonel W. Green, D.S.O., to be Major-Generals.

Representative Colonels Commandant for 1935.

The undermentioned Colonels Commandant will be the Representative Colonels Commandant of their respective Corps during the year 1935 :—Major-General G. H. A. White, C.B., C.M.G., D.S.O., Colonel Commandant, Royal Artillery ; General Sir George M. Kirkpatrick, K.C.B., K.C.S.I., Colonel Commandant, Royal Engineers ; Colonel (honorary Brigadier) H. C. Smith, D.S.O., Colonel Commandant, Royal Corps of Signals ; Colonel (honorary Major-General) Sir Ernest D. Swinton, K.B.E., C.B., D.S.O., Colonel Commandant, Royal Tank Corps ; The Reverend W. S. Jaffray, C.M.G., C.B.E., D.D., honorary Chaplain to the King, Chaplain Commandant, Royal Army Chaplains' Department ; Major-General E. Gibb, C.B., C.M.G., C.B.E., D.S.O., Colonel Commandant, Royal Army Service Corps ; Major-General O. L. Robinson, C.B., C.M.G., Colonel Commandant, Royal Army, Medical Corps.

Regimental Colours.

Centre Badges.—Centre Badges for Regimental Colours of the undermentioned regiments have been approved as follows :—

The East Lancashire Regiment—The Red Rose charged in the centre with a sphinx, the plinth inscribed " Egypt."

The Border Regiment—A laurel wreath.

Four-Wheeled Transport.

The 5th Infantry Brigade is to test a new four-wheeled vehicle for first-line transport : four-wheeled vehicles will also be used experimentally in devising a mechanized substitute for Cavalry which is to be carried out in the 2nd Cavalry Brigade by the 3rd The King's Own Hussars.

Revolvers.

Regular Army Reserve of Officers.—Consequent upon the re-armament of the Regular Army with pistols, revolver, No. 2 (.38-in.), officers of the Regular Army Reserve of Officers, including the Supplementary Reserve of Officers, are informed that on and after 1st November, 1935, the possession, use and carrying by them of the pistol, revolver, No. 1 (.455-in.), will no longer be covered by Section 1(8)(a) of the Firearms Act, 1920. It will be necessary for any such officer desirous of retaining his .455-in. pistol from that date to be in possession of a Firearms Certificate in accordance with Section 1(2), or a dispensation under Section 13(2), of the Firearms Act, 1920.

Officers who do not desire to retain their .455-in. revolvers are invited to return them to the Chief Ordnance Officer, Royal Arsenal, Woolwich, London, S.E.18. Weapons may be sent by post and the postage need not be prepaid provided they are despatched by letter post and the weight of each package does not exceed 3 lbs. Compensation cannot be given for any weapons returned, and the property in

the revolver will pass to the War Department: in the event of any officer being called up for service he will be provided with a pistol revolver from public equipment, free of cost.

Disposal of Officers of the Royal Artillery.

In order to provide for the retirement of a certain number of officers of the rank of subaltern, captain and major, with a view to unblocking promotion, the following conditions have been published. The following is a summary of the terms offered on retirement.

I.—*Retired pay.*—Officers who are assessable for retired pay, as having, on the date of retirement, 15 or more years service reckoning towards retirement, will be awarded retired pay at the rates appropriate on the normal scale applicable to their service and rank, together with an addition, called "compensation element," of £60 a year. This compensation element will be granted irrespective of rank. But when retired with a compensation element of retired pay, if he is within 2 years of the normal age limit of his rank, he will have his compensation element proportionately reduced.

(2) An officer whose retired pay includes a compensation element will be at liberty to commute the compensation element (after cost of living revision) in whole or in part, whether he is under or over the age of 40 years.

II.—*Gratuities.*—An officer not assessable for retired pay, as having, on the date of retirement, less than 15 years' service, will be retired with a gratuity on the following scale:—

Rank.	Basic gratuity.	Service addition.
	£	
Lieutenant	720	£100 for each year's service.
Captain with less than 13 years' service	900	
Captain, with 13 or 14 years' service	990	

III.—*Conditions of issue.*—The amount laid down in this Schedule will be paid to an officer on retirement, provided that he has not at that time received employment under a public department, on condition that each officer before retirement signs an undertaking (*a*) to have his retired pay adjusted or to refund the difference between what he has so received and any smaller amount to which he may be entitled, and (*b*) to notify the War Office of any employment affecting his entitlement.

(2) Special provisions have been published whereby officers who may subsequently obtain a permanent commission (or a temporary commission with a view to a permanent commission) or a short-service commission in the Royal Navy (including the Royal Marines), the Army or the Royal Air Force, will have their retired pay suspended during the period of re-employment, or the gratuity received will be in part recovered from the officer's future pay.

(3) An officer who retired with a gratuity and is appointed to permanent employment under a public department (other than as a commissioned officer)

within a period of 2 years from the date of his retirement will retain the service addition of £100 for each complete year of service, together with a certain proportion of his gratuity.

(4) An officer who obtains employment under a public department (other than as a commissioned officer) after 2 years have elapsed since retirement may retain the whole of the emoluments.

THE TERRITORIAL ARMY

The latest official returns show that during the month of January, 1935, 1,689 recruits were finally approved for the Territorial Army. This is an increase of 351 recruits compared with the number approved in December last, and 145 recruits more than in January, 1934.

The number of recruits obtained in each Command during January was as follows:—Eastern Command 310; London District 218; Northern Command 286 Scottish Command 252; Southern Command 271, and Western Command 352.

The total strength of the Territorial Army (other ranks) on 1st February, 1935, was 122,374; this is 1,084 less than on 1st January, 1935, and a decrease of 2,416 compared with the strength on 1st February, 1934.

The strengths of the 14 Infantry Divisions on 1st February, 1935, were as follows (the corresponding figures on 1st January being shown in brackets):—51st (Highland) Division 8,362 (8,402); 50th (Northumbrian) Division 8,069 (8,188); 53rd (Welsh) Division 7,880 (8,022); 42nd (East Lancashire) Division 7,549 (7,661); 43rd (Wessex Division 7,609 (7,641); 49th (West Riding) Division 7,436 (7,490); 46th (North Midland) Division 7,352 (7,475); 55th (West Lancashire) Division 7,071 (7,114); 44th (Home Counties) Division 6,882 (6,974); 52nd (Lowland) Division 6,792 (6,864); 48th (South Midland) Division 6,738 (6,848); 54th (East Anglian) Division 6,480 (6,486); 56th (1st London) Division 5,601 (5,653); and 47th (2nd London) Division 5,137 (5,188).

The number of officers of the Territorial Army on 1st February, 1935, was 7,023; this is a decrease of 7 during the month and the number is 1,120 short of establishment.

DOMINION FORCES

SOUTH AFRICA

SHORT SERVICE BATTALION.—In order to relieve unemployment a short-service Pioneer Battalion is being established at Bloemfontein. The strength of the battalion will be 500 men. Recruits must be between the ages of 17 and 25 years, unmarried, and no educational qualifications are prescribed. Service will be for three months, during which period training will be confined to infantry drill, rifle exercises and physical training. On termination of their period of engagement, men will be drafted to employment on Government irrigation schemes, etc.

REGIMENTAL ALLIANCES.—H.M. the King has approved of the following alliances:—

The 7th Hussars, Non-Permanent Active Militia of Canada, to the 7th Queen's Own Hussars.

The 110th Field Battery, Australian Field Artillery, to the 100th Field Battery, Royal Artillery.

The Edmonton Regiment of the Non-Permanent Active Militia of Canada to the Kimberley Regiment, Union of South Africa Defence Forces.

INDIAN ARMY

General Sir Robert A. Cassels, G.C.B., C.S.I., D.S.O., has been nominated to succeed, as Commander-in-Chief in India, Field-Marshal Sir Philip W. Chetwode, Bart., G.C.B., G.C.S.I., K.C.M.G., D.S.O., whose tenure of command expires on 30th November next.

Major-General H. J. Huddleston, C.B., C.M.G., D.S.O., M.C., Colonel, The Dorsetshire Regiment, has been appointed Commander, Baluchistan District, India, in succession to Major-General H. Karslake, C.B., C.M.G., D.S.O.

FOREIGN

FRANCE

Introduction of Two-Year Colour Service.—Re-introduction of a two-year period of colour service in the army was adopted by the Chamber after a debate during the first days of March.

The reasons for this step are to be found in a long semi-official pronouncement made by Maréchal Pétain which appeared as a special insertion in the *Revue des Deux Mondes* for 7 March, 1935, the date immediately preceding the discussion of the subject in the Chamber.

The gist of the Maréchal's arguments are as follows:—

The present French military system dates from 1927–28: the general organization of French defence was fixed by the law of 1927[1]; the system of recruitment was prescribed in the law of 1928.[2] According to the latter some 200,000 men were rendered available for service every year. These were incorporated in two annual contingents of 100,000 at an interval of six months. With the long service cadres this meant that France had 150,000 trained men available at any instant for meeting a surprise attack.

So long as Germany's army was not very much stronger than 100,000 men the French total seemed adequate. But the German re-armament now in progress puts a different complexion on the matter, especially as France will be faced between 1936 and 1940[3] with a shortage of recruits; the latter is brought about by the low birth-rate during the years 1915 to 1919.

The situation must be reconsidered.

The German army is increasing its strength at an unforeseen speed. In 1935 its peace establishment will rise to 400,000 men. In place of seven it will consist of twenty-one divisions The armed military police will soon number 200,000 men. Lastly, there exist various para-military organizations.

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[1] See R.U.S.I. Journal for 1927, p. 376 and p. 839.

[2] See R.U.S.I. Journal for 1928, p. 584 and 814.

[3] These years are known as "les années creuses," i.e., the years of depression when shown on a graph.

It is calculated therefore that before long Germany will be able to mobilize :—

(*a*) Frontier defence divisions to the number of about fifty, all within a space of one to three days ;

(*b*) A field army consisting of two echelons ; the first of these would be the active army of 25 to 30 divisions, i.e., 600,000 to 700,000 men to be mobilized in a very brief space of time : the second echelon would be formed of para-military formations stiffened by appropriate cadres.

In all this amounts to a total of 85 to 100 divisions, that is to say about the same total as the German army was in 1914.

But, in addition, there is now a new German air force which will be a truly formidable service by 1936. Finally, the recent development of war industry has to be taken into serious account in estimating Germany's preparedness for war.

Since 1918 the whole trend of military development has inclined to the planning of a sudden and long premeditated attack. A combined onslaught by land and sea will be supported by relentless aerial bombardment. The suddenness of the stroke is to be the cause of its success ; the process has been formulated by von Seeckt and his successors. It has been defined as follows :—" The strategy of the future must seek to concentrate all available forces at the first moment of hostilities. The effect of the surprise must be so devastating as to render the enemy incapable of organizing any defence."

What are the needs of France to guard against such an attack ?

Firstly, an active army capable of maintaining her front against a surprise attack.

Secondly, her reserve army, mobilized under cover of the active army, must be in a better position to take the field, both with regard to time and to efficiency.

In order to meet the possible thrust directed anywhere between Lille and the Swiss frontier, the covering forces must be so armed that they can hold the front. Then there must be some larger formations ready to move up to the support of this line. Lastly, there must be some army in general reserve. This means that the entire active army of France will be absorbed in these tasks : its numbers can therefore under no circumstances be reduced.

But the French higher formations are at present, in time of peace, in no state to fulfil these tasks, partly owing to lack of numbers, partly owing to inadequate training. The French fortress troops are as yet deficient of men : consequently, the French fortified system is not impervious to a sudden attack which might penetrate a weak joint and so cause the whole line to crumble.

During 1934 the task of making good these shortcomings was taken in hand : by various means the French peace strength was raised from 210,000 to 240,000 men. But now, in view of the German rearmament, France needs between 280,000 and 290,000 men in her peace-time army to permit of these tasks being fulfilled.

In addition to numerical weakness, the French active army has been further handicapped by a fall in efficiency, occasioned by the shorter period of service and by the embodiment of recruits at six-month intervals.

This situation of inferiority can only be remedied by the suppression of the six-monthly embodiment of recruits and by the reconstitution of the cadre-units.

Moreover, the active army must be able to reckon on the support of reserve divisions within a much shorter period of time than the present system allows. In 1914, these latter divisions took the field in an untrained condition: it was only in 1915 that the two types of divisions grew alike in cohesion and fighting value. To-day the cadres of the reserve divisions are inferior to those of 1914. It is imperative to make good these defects. But the process of strengthening these reserve divisions, while strengthening the divisions of the active army, can only be achieved by increasing the period of service. Such a step would become advisable, even if France could reckon upon normal contingents of recruits; now that the lean years are imminent, it has become inevitable.

From a normal figure of 240,000 recruits per annum the total of available men between 1936 and 1940 will not exceed 120,000, owing to the low birth-rate of the years 1915–1919. Already resort has been made to various artifices to circumvent the difficulty: the embodiment of a smaller recruit contingent—the balance being postponed for a later date; lowering the age for embodiment from 21 to 20 years of age. These measures were, in fact, wholly inadequate.

What steps can now be taken to rectify the danger that is impending?

(i.) *One year colour service.* This could only prove effective if the total number of men re-engaging for a second year of service could be found.

(ii.) *Fifteen or sixteen months colour service.* That again is a measure depending on re-engagements or the possible increase of coloured troops serving in France. Neither condition is desirable, nor is it practicable.

(iii.) *Eighteen months colour service.* The annual recruit contingent would thereby yield 240,000 men; but this method would not obviate the necessity for re-engagements whilst leaving the bad system of embodiment at six-monthly intervals.

(iv.) *Two year colour service.* From every point of view this is the very best solution of the problem. It means that the recruits will all be well over 20 years of age and that the necessary number of re-engagements will not exceed 20,000 per annum. Moreover, from the point of view of efficiency, this step will allow of a great improvement in the training of the active army. This, indeed, is now sorely needed. The quality of the non-commissioned ranks will be much enhanced, while an analogous improvement will spread to the reserve divisions. In every direction there will accrue a considerable rise of efficiency, and still more of morale and of solidarity within units and formations.

When must the new term of service be instituted? The first annual contingent of the "lean years" is due to be embodied in April, 1936. Consequently, the new law should be applicable to the recruit contingents of 1935. The April contingent must be embodied for 18 months, the November contingent for 2 years' service.

This lengthening of the period of service should be applied until 1940. At that date the return to a normal birth-rate, a better preliminary military training of boys, an improvement in our defences north of Montmédy, the development of the political situation in Germany and elsewhere, all these factors may perfectly well warrant a return to former conditions.

As the situation now is, it is France that is seeking to establish military parity with Germany, and France by the adoption of the new 2-year law will have:—

280,000 men in the peace active army to be raised under the new law ;
65,000 professional soldiers in France ;
45,000 native troops serving in France ;
15,000 frontier and other guards.

That is a total of 405,000 men as against the 600,000 men to be maintained by Germany.

To the credit side of the account there stands the fortified zone defending the Eastern frontier, but even that cannot counterbalance the advantages to be derived from a larger population, a highly developed war industry, and—still more—the advantage of sudden attack.

GERMANY

See International Situation, p. 407, for Herr Hitler's latest pronouncement on Germany's military requirements.

AIR NOTES

ROYAL AIR FORCE

Air Estimates

The Air Estimates for 1935 amount to £23,851,100 and make provision for the first stage of the expansion of the Royal Air Force approved by Parliament in the summer of 1934. This sum includes £1,873,000 for the Fleet Air Arm, which sum is actually provided out of the Naval Estimates in the form of a grant in aid. The estimates show a net increase of £3,089,000.

In an accompanying Memorandum [1] reference is made to the details of the expansion of the Service. This provides for an addition of a total of 41½ squadrons by the end of 1938, which will bring the first-line strength in regular squadrons up to approximately 1,330 aircraft. In addition there will be some 130 aircraft in non-regular squadrons. Four of these regular squadrons were formed in 1934, and a further twenty-five are to be formed during 1935 and 1936. In 1935 eleven new squadrons will be added to the Home Defence Force, which will then comprise fifty-four squadrons, of which forty-one will be regular and the balance Auxiliary Air Force or Cadre (Special Reserve) squadrons.

The Fleet Air Arm will be increased by nineteen first-line aircraft. These new formations will raise the total strength of the Royal Air Force, including the Fleet Air Arm, to the equivalent of 106½ squadrons, i.e., 93½ regular squadrons and thirteen non-regular squadrons of the Home Defence Force.

Personnel.—There is an increase of £337,500 in respect to personnel, the net total for which is £4,547,000. Special measures were taken during the year to meet the personnel requirements of the expansion scheme; these include largely augmented entries from civil life and extension of service of selected officers and airmen. Entry into permanent commissions through the R.A.F. College and the Universities has been increased, while the number of short-service officers to be entered from civil life and airmen pilots from within the Service will rise from 250 to 540. A fourth Flying Training School was opened in October to cope with the additional entries, and a fifth will be opened in April.

The yearly entry of boys for aircraft apprentices is being increased from 550 to over 1,000. Steps are being taken to broaden the basis of the existing flying training organization, while at the same time raising the standard of efficiency of the pilot on first joining a squadron. A new class for "boy entrants" has been introduced to provide armourers, wireless operators, and photographers. A new type of Air Observer who will replace in great part the present Air Gunner is also being introduced. These Observers will be trained from airmen, mainly those of the armament, signal, and photography trades.

Auxiliary and Reserve Forces.—The vote for Auxiliary and Reserve Forces shows an increase of £76,000 on 1934, and amounts to £470,000. The system of entry is being placed on a new and broader basis. Entrants for flying duties will in future be accepted only as airmen pilots, and will become eligible in due course to compete for a limited number of reserve commissions. Measures are being taken to widen the field of recruitment into permanent commissions from the Universities of Oxford

[1] Cmd. 4822 of 27th February, 1935. 2d.

and Cambridge, and it has been decided to make a more extended use of the University Air Squadrons. An air squadron is being formed at London University.

Technical Developments.—A contribution is made towards the cost of the construction of a composite aircraft to the order of Imperial Airways. This takes the form of a heavily loaded seaplane mounted on a lightly loaded flying boat from which it will be released when sufficient height has been obtained, the object being to extend the range of high-speed aircraft and to enable them to carry a load which would be beyond their lifting capacity by their own unaided power.

Two experimental aircraft specially designed for high-altitude and long-range flying are being constructed.

A "Comet" aircraft has been purchased with a view to research into the aerodynamic qualities of this type.

Airships.—The Royal Airship Works at Cardington and the mooring masts and plant at Karachi and Ismailia are being maintained on a care and maintenance basis. A nucleus staff at Cardington continues to study airship development abroad.

Works.—Work will be begun on ten new stations during the year, but where possible new squadrons will be located at existing stations, and provision is made for the enlargement or adaptation of twelve such stations in 1935. The construction of the new Air Armament School at Manby, in Lincolnshire, is being commenced; this will replace the present inadequate accommodation at Eastchurch. Work on the new air base in Iraq and for the accommodation of the Royal Air Force units at Singapore is proceeding. A new aerodrome is to be constructed at Malta and a landing ground provided at Trincomali.

Meteorological Service.—A number of auxiliary weather reporting stations are being established during 1935 in North England, Scotland, and the Isle of Man. Extra provision is also being made for supplying meteorological information for night flying on Empire air routes.

Air Ministry.—A vote of £752,000 for the Air Ministry shows an increase of £95,000. This is due to the extra work involved by the expansion of the Royal Air Force. The Air Council has been enlarged by the addition of an Air Member for Supply and Organization.

Appointments

The following appointments have taken effect as from the dates shown:—

Air Vice-Marshals.—C. S. Burnett, C.B., C.B.E., D.S.O., to command Headquarters, Inland Area, 8th January; W. G. S. Mitchell, C.B., C.B.E., D.S.O., M.C., A.F.C., as Air Officer Commanding Royal Air Force, Iraq, 31st December, 1934; C. L. N. Newall, C.B., C.M.G., C.B.E., A.M., to Air Ministry as Air Member for Supply and Organization, 14th January.

Air Commodores.—A. W. Iredell to Air Ministry as Director of Medical Services, 1st March.

Group Captains.—K. C. Buss, O.B.E., to No. 4 Flying Training School, in command, 9th February; A. Corbett-Wilson to Station Headquarters, Boscombe Down in command, 26th January; W. C. Hicks, A.F.C., to R.A.F. Base, Gosport in command, 5th March; J. McCrae, M.B.E., to Home Aircraft Depot in command, 15th March; F. Sowrey, D.S.O., M.C., A.F.C., to R.A.F. Depot, Middle East, in command, 16th January.

Retirement.

Air Vice-Marshal J. McIntyre, C.B., M.C., M.B., B.Ch., K.H.S., placed on retired list at own request, 1st March, 1935.

Honorary Surgeon to the King.

The King has approved of the appointment of Air Commodore A. V. J. Richardson, O.B.E., M.B., B.Ch., D.P.H., as an Honorary Surgeon to His Majesty, *vice* Air Vice-Marshal J. McIntyre, C.B., M.C., M.B., B.Ch., who has vacated the appointment on retirement from the Royal Air Force.

Honours and Rewards.

The following rewards to personnel of the Royal Air Force, in recognition of gallant and distinguished service rendered in connection with the operations against the Quteibi Tribe, in the Aden Protectorate, during the period March–May, 1934, were published in the *London Gazette* dated 22nd January, 1935 :—

D.F.C.—Squadron Leader H. B. Russell, A.F.C.

Mention.—Flight Lieutenant Douglas Macfadyen.

Personnel.

R.A.F. Staff College.—The following officers satisfactorily completed the twelfth course (1934) at the R.A.F. Staff College :—

Royal Air Force.—Squadron Leaders C. A. Stevens, M.C. ; H. I. T. Beardsworth ; O. E. Carter, A.F.C. Flight Lieutenants E. J. L. Hope, A.F.C. ; R. Pyne, D.F.C. ; J. W. F. Merer ; R. Jones ; A. H. H. MacDonald ; G. R. C. Spencer ; J. B. H. Rogers ; I. E. Brodie ; R. N. Waite ; G. Combe ; P. J. R. King ; W. L. Dawson ; C. E. N. Guest ; E. B. Addison ; R. O. Jones ; O. B. Swain ; S. H. V. Harris ; R. G. Hart ; G. L. Worthington (Stores).

Dominion Air Forces.—Squadron Leader J. E. Hewitt, and Flight Lieutenant J. Waters, R.A.A.F. ; and Flight Lieutenants B. F. Johnson and E. E. Middleton, R.C.A.F.

The following officers of the Royal Navy, the Army, and the Indian Army have satisfactorily completed the twelfth course (1934) at the R.A.F. Staff College :—

Royal Navy.—Commanders A. E. M. Cunninghame Graham, R.N., *p.s.c.*, and T. M. Smith, R.N., *p.s.c.*

Army.—Major E. J. Medley, M.C., R.A., *p.s.c.*

Indian Army.—Captain J. R. Reynolds, *p.s.c.*

Staff College, Camberley.—Squadron Leaders S. E. Toomer, D.F.C., *p.s.a.*, and R. J. Divers, M.B.E., *p.s.a.*, satisfactorily completed the course at the Staff College, Camberley, which terminated in December, 1934.

Staff College, Quetta.—Wing Commander J. H. D'Albiac, D.S.O., *p.s.a.*, satisfactorily completed the course at the Staff College, Quetta, which terminated on 17th December, 1934 :—

Imperial Defence College.—The following officers have completed satisfactorily a course at the Imperial Defence College which terminated on 14th December, 1934 :—Group Captains J. S. T. Bradley, O.B.E., and T. L. Leigh-Mallory, D.S.O., *p.s.a.* ; Wing Commander A. W. F. Glenny, M.C., D.F.C., *p.s.a.* ; and Squadron Leaders A. P. M. Sanders, *p.s.a.*, and O. R. Gayford, D.F.C., A.F.C., *p.s.a.*

ROYAL NAVAL STAFF COLLEGE, GREENWICH.—Wing Commander R. G. Gardner, D.S.C., and Squadron Leader R. V. Goddard, *p.s.a.*, satisfactorily completed the course at the Royal Naval Staff College, Greenwich, which terminated in December, 1934.

ATTACHMENT OF FOREIGN OFFICERS TO ROYAL AIR FORCE UNITS.—Captain Arimori, of the Japanese Military Air Service, was attached to the Home Aircraft Depot, Henlow, Bedfordshire, from 21st January, 1935, to 30th March, 1935, and to the Central Flying School, Wittering, from 1st to 18th April, 1935, for a Flying Refresher Course.

Lieutenants Sparre and Hanson, of the Swedish Air Force, have been attached to the R.A.F. Base, Leuchars, from 11th March, 1935, for catapult training.

Captain Napakas, of the Siamese Air Force, was attached to No. 24 (Communications) Squadron, Hendon, from 27th February, 1935, to 23rd March, 1935, for a Refresher Course; to No. 32 (Fighter) Squadron, Biggin Hill, from 2nd to 18th April, and to No. 1 (Fighter) Squadron, Tangmere, from 23rd April, where he will remain until 18th May, 1935.

THE CALWELL BEQUEST.—In accordance with a generous bequest in the will of the late Flying Officer A. K. K. Calwell, a sum of approximately £2,600 is invested under a scheme by which the trustee, who is the Secretary of State for Air, can apply the income for the benefit of persons being in need of assistance and being the widows or the children of officers who held commissions in the Royal Air Force, and who died as the result of flying accidents while on duty.

Inquiries in regard to grants from the Calwell Bequest should be addressed to the Secretary, Air Ministry, Adastral House, Kingsway, W.C.2. It should be noted that grants are strictly limited to persons who come within the terms of the scheme as specified above.

SUBSTITUTION OF "AIR NAVIGATION" FOR "AIR PILOTAGE."—The use of ths term "air pilotage" is to be discontinued; in all correspondence and reports relating to this subject the term "air navigation" is to be used.

The following changes of title will be made:—

(i) Air Pilotage School to be "Air Navigation School."

(ii) The 13 weeks' Air Pilotage Course to be "Short Navigation Course."

(iii) The "N" Course at R.A.F. Base, Calshot, to be "Specialist Navigation Course."

(iv) Manual of Air Pilotage (A.P. 1234) to be "Manual of Air Navigation, Vol. I."

(v) Manual of Air Navigation (A.P. 1456) to be "Manual of Air Navigation, Vol. II."

Air pilotage officers will be termed "navigation officers" and will be denoted by the symbol (sn) in the List of Units in the Air Force List when filling vacancies for which officers so qualified are allowed. Specialist "N" officers will continue to be denoted by the symbol N in the gradation list, and by the symbol (n) when filling vacancies for which officers so qualified are allowed.

AIR ATTACHÉS—REGROUPING OF COUNTRIES.—In consequence of the appointment of an Air Attaché at Brussels, the following regrouping of countries for Air Attachés has been carried out:—

Air Attaché, Berlin. Accredited to Germany and Poland.

Air Attaché, Brussels. Accredited to Belgium, Holland, Denmark, Norway, and Sweden.

Air Attaché, Paris. Accredited to France, Portugal, and Spain.

Air Attaché, Rome. Accredited to Italy and Switzerland.

MATERIAL.

NOMENCLATURE—The official name of the Fairey torpedo spotter reconnaissance aeroplane fitted with Pegasus engine is " Swordfish."

The official name of the communication aeroplane with Gipsy Major engine, dashboards arranged for blind flying and fixed portions of night-flying and blind-flying equipment is " Tiger Moth II." The Tiger Moth aeroplane with Gipsy III engine at present in service will accordingly be known in future as " Tiger Moth I."

The official name of the Avro navigational training aeroplane fitted with Lynx IV * engine is " Prefect."

OPENING OF WIND TUNNEL AT THE R.A. ESTABLISHMENT, FARNBOROUGH.—The 24 feet wind tunnel which has been erected at the Royal Aircraft Establishment, Farnborough, for the purpose of carrying out tests on full-size aircraft, was officially opened by the Marquess of Londonderry, Secretary of State for Air, on Friday, 5th April, 1935.

RE-EQUIPMENT OF UNITS.—The following re-equipment of Royal Air Force Units has recently taken place :—

	Unit.		*Details.*		
No.	30	Squadron	Hardy	replaced	Wapiti.
,,	36	,,	Vildebeest	,,	Horsley T.B.
,,	205	,,	Singapore	,,	Southampton.
,,	604	,,	3 Hart	,,	Wapiti.
,,	820	,,	Shark	,,	Seal.
,,	447	Flight	Osprey	,,	IIIF. F.A.A.

The following units are expected to complete or commence re-equipment during the next few months :—

*No.	7	Squadron	Heyford	replacing	Virginia.
* ,,	8	,,	Vincent	,,	IIIF. G.P.
* ,,	19	,,	Gauntlet	,,	Bulldog IIA.
,,	24	,,	Hart	,,	Osprey.
,,	29	,,	Demon	,,	Bulldog IIA.
,,	101	,,	Overstrand	,,	Sidestrand.
* ,,	202	,,	Scapa	,,	Southampton.
,,	208	,,	Audax	,,	Atlas A.C.
,,	604	,,	Demon	,,	Hart and Wapiti.
,,	4	Flying Training School	Audax	,,	Atlas A.C.
,,	1	Coast Defence Training Flight	Osprey	,,	IIIF. F.A.A.
,,	204	Squadron	Scapa	,,	Southampton.

* Re-equipment of these units has already commenced.

ORGANIZATION.

No. 6 Flying Training School, formed at Netheravon on 1st April, 1935, under the Air Officer Commanding, Inland Area, in No. 23 Group, with effect from that date. Station Headquarters, Netheravon, ceased to exist from 14th April, on which date the Station came under Officer Commanding No. 6 Flying Training School.

No. 13 (Army Co-operation) Squadron moved from Netheravon to Old Sarum on 6th April, 1935.

The name of the R.A.F. Pathological Laboratory, Halton, has been changed to "The Royal Air Force Institute of Pathology and Tropical Medicine, Halton."

With effect from 1st April, No. 1 Coast Defence Training Unit was named "The Coast Defence Development Unit."

The names of the following R.A.F. Bases were changed with effect from 1st April :—

Former Name.	*New Name.*
R.A.F. Base, Calshot	R.A.F. Station, Calshot.
R.A.F. Base, Gosport..	R.A.F. Station, Gosport.
R.A.F. Base, Kai Tak	R.A.F. Station, Kai Tak.
R.A.F. Base, Leuchars	No. 1 Flying Training School.
R.A.F. Base, Malta	R.A.F. Station, Calafrana.
R.A.F. Base, Singapore	R.A.F. Station, Singapore.

No. 1 Flying Training School will continue to be administered by Air Officer Commanding, Coastal Area.

The numbers allocated to the Squadrons forming in the financial year 1935–36 are as follows :—

No. 21 (Bomber)	Upavon.
„ 34 (Bomber)	Upavon.
„ 42 (Bomber)	Donibristle.
„ 46 (Fighter)	Henlow.
„ 48 (General Purpose)	Manston.
„ 66 (Fighter)	Duxford.
„ 74 (Fighter)	Hornchurch.
„ 83 (Bomber)	Upavon.
„ 97 (Bomber)	Mildenhall.
„ 104 (Bomber)	Bircham Newton.
„ 151 (Fighter)	North Weald.

No. 209 (Flying Boat) Squadron has moved from Mount Batten to Felixstowe, as from 1st May.

HOME COMMANDS

ROYAL REVIEW OF THE ROYAL AIR FORCE.—H.M. the King has intimated that he will review the Royal Air Force at Mildenhall and Duxford on Saturday, 6th July, as part of the celebrations for his Silver Jubilee. Over thirty squadrons will participate. There will be a ground inspection at Mildenhall aerodrome followed by an aerial review at Duxford aerodrome.

EMPIRE AIR DAY, 1935.—It has been decided to hold an Empire Air Day again this year on the same lines as in 1934, and home stations selected to take part will be opened to the public, at a small charge for admission, on the afternoon of Saturday, 25th May, 1935.

ROYAL AIR FORCE DISPLAY, 1935.—The sixteenth annual Royal Air Force Display will be held at the Royal Air Force Station, Hendon, on Saturday, 29th June, 1935.

ARMY CO-OPERATION

There is little of interest to record during the past few months. Beyond a certain interchange of lectures, visits by Army Units to Air Force Stations and the

Higher Commanders Course at the School of Army Co-operation, Old Sarum, work has been of a purely routine nature and chiefly concerned with individual training of pilots.

OVERSEAS COMMANDS

Operations and Flights.

Air Support for Tochi Scouts.—During October, 1934, on receipt of a message brought by carrier pigeon from the Commandant, Tochi Scouts, an aeroplane was despatched to assist a party of these Scouts who were acting as escort to the Resident of Waziristan while carrying out a tour in tribal territory. The aircraft appeared over the Scouts within 45 minutes of the despatch of the pigeon. Its presence acted as a deterrent against further interference by the tribesmen who had been sniping the party.

Aden–West Africa return Flight.—The four Fairey IIIF aircraft of No. 8 (B) Squadron commenced the return flight from Freetown, Sierra Leone, on 27th January, and, following the same route as on the outward flight (reported in last quarter's Notes), arrived back at Aden on 10th February, having completed the round flight of approximately 11,000 miles without untoward incident.

Reconnaissance of Northern Hadhramaut.—An interesting reconnaissance was carried out during November, 1934, by No. 8 (Bomber) Squadron of the area North of the Hadhramaut, with the object of finding out the extent and nature of the country between it and the Great Desert, the southern edge of which was believed to lie about 60 miles from Shibam and about 20 from Tarim. Starting from Shibam, the aircraft covered distances of 65, 70 and 50 miles in three directions. Visibility varied from about 15 to 30 miles, but at no point was any great expanse of sand visible. At the first turning point two sectors of the circle of visibility were observed to consist entirely of sand, but apart from these sectors the whole of the country visible during the flight consisted of rock formation. The general height above sea-level appeared to be about 2,000–3,000 feet. The only signs of human life seen throughout the flight were a few tracks and a strip of cultivation about a mile long in a wadi-bed, together with a few houses, at a point about 30 miles N.N.W. of Shibam.

It would therefore appear that the Great Desert does not extend to within 75 miles of the part of the Hadhramaut valley lying between Shibam and Tarim.

Reconnaissance of Area S.E. of Nisab.—A survey of the area South-East of Nisab was carried out on the 16th November by three aircraft of No. 8 (Bomber) Squadron, Aden, with the object of locating possible landing ground sites which are required for political purposes. A suitable site was discovered at Seina—150 miles N.E. of Aden, and a possible one at Izzan—110 miles West of Mukalla.

Medical Assistance to Miss Freya Stark at Shi Bam.—On the 14th March, at the request of the Political Resident, a medical officer was flown to Shi Bam in the Hadhramaut, where there is no qualified doctor, to render assistance to Miss Freya Stark, a famous explorer, who was reported to be seriously ill. She was removed by air to hospital at Aden on 16th March.

Visit of C.-in-C., East Indies Squadron, to the Shah.—On 7th January, Vice-Admiral F. F. Rose, C.B., D.S.O., the Commander-in-Chief, East Indies Squadron, and officers from H.M.S. "Hawkins" were conveyed in a Victoria of No. 70 (Bomber Transport) Squadron from Basra to Hinaidi. The party left Hinaidi the same day by air from Khanaqin, whence they proceeded by road to

Teheran. During his stay the Commander-in-Chief was granted an audience with the Shah. The party were conveyed by air on their return journey on the 12th from Khanaqin to Basra, and thence by launch to H.M.S. " Hawkins."

Tour of Persian Gulf by A.O.C. Iraq.—During January the A.O.C. British Force in Iraq, together with a party of Staff Officers, made a tour of the Persian Gulf. They were conveyed to Basra in a Victoria of No. 70 (Bomber Transport) Squadron, and from there by two Rangoons of No. 203 (Flying Boat) Squadron. The oil-fields at Jebel, in Bahrein, were visited during the tour and an inspection made of the landing grounds at Ras Al Khaimah. Visits were paid by the Air Officer Commanding to the Shaikhs of Sharjah and Dibai, and also to Isa, the local representative of the Honourable the Political Resident in the Persian Gulf. No. 203 (Flying Boat) Squadron at Basra and the R.A.F. Station at Shaibah were inspected on the return journey.

Tour of Persian Gulf by British Ambassador and A.O.C., Iraq.—On 1st February the British Ambassador, Sir Francis H. Humphrys, K.C.M.G., G.C.V.O., K.B.E., C.I.E., and the A.O.C. British Force in Iraq, left Hinaidi in a Victoria of No. 70 (Bomber Transport) Squadron to carry out a short tour in the Persian Gulf. From Basra they proceeded to Fao in two Rangoons of No. 203 (Flying Boat) Squadron, and thence to Bushire, where the night and following day were spent. Discussions were held there with the Political Resident in the Persian Gulf. The party returned to Basra on the 3rd, and on the 4th to Hinaidi.

Reconnaissance of the Persian Frontier by the A.O.C. Iraq.—On the 12th February a reconnaissance of the Persian frontier was carried out by the Air Officer Commanding British Forces in Iraq, accompanied by the Air Liaison Officer, Sulaimania, and the British Consul, Diana, in aircraft from No. 55 (Bomber) Squadron and the Iraq Communication Flight.

Visit by H.E. the High Commissioner for Egypt and the Sudan to the Sudan.—On 10th February H.E. the High Commissioner for Egypt and the Sudan was conveyed in a Victoria aircraft of No. 216 (Bomber Transport) Squadron from Heliopolis to Khartoum, where he arrived on the 12th. On the return journey he was conveyed by an Imperial Airways aircraft to Amman, and from there to Heliopolis in a Victoria of No. 216 (Bomber Transport) Squadron.

FOREIGN

ARABIA

The nucleus of a Saudi-Arabian air force composed of four ex-Royal Air Force officers with four Westland " Wapiti " aeroplanes was initiated in 1931 by King Ibn Saud. Now eight young Arabs are to undergo an aviation course in Italy with a view to the extension of the force in the near future.

CZECHOSLOVAKIA

Passive Defence Measures.—Under a new law owners of large enterprises and institutions in Czecho-Slovakia will be compelled to build gas-proof shelters on their premises, and the authorities are given the right to compel the public to acquire gas masks. Municipalities are obliged to provide shelters and masks for the general public ; they are also permitted to impose rates to cover their expenses.

New Aircraft Firms.—Three new companies have entered the aircraft industry in Czechoslovakia. The firm of Ringhoffer intend to build tourist aircraft, that of Tatra aero engines, and Bata (the shoe firm) tourist aircraft. The latter firm is

reported to have already produced a two-seater which they hope to market at £251 each.

FRANCE

PASSIVE DEFENCE.—An important Bill which legalizes the passive defence measures and organization which have been adopted after trial in France was passed into law on 8th April, 1935.

The organization of passive defence against the danger of air attack is obligatory throughout the whole of the national territory. The Minister of the Interior is responsible . . . for directing and co-ordinating between the various Ministries and supervising the preparations and organization of passive defence, examined in its various branches by the competent State departments, and regionally or locally by the authorities representing the central authority. He is assisted for this purpose by a Supreme Commission for Passive Defence, the composition and working of which is established by him.

When a state of siege is declared the provisions of the law of 9th August, 1849, relating to the duties and functions of the Military authority, are extended to passive defence.

In each department the Prefect is responsible for the preparation and carrying into effect of passive defence, with the co-operation of the mayors, under the conditions laid down by the law of 5th April, 1884, and subsequent laws, and in the departments of the Moselle and Upper and Lower Rhine, by the provisions of the local municipal laws.

Private establishments and undertakings which are of national or public interest may be designated by the order of the Minister of the Interior as responsible for their own protection against air attack.

For passive defence measures a complementary personnel, composed of the following, shall be attached to the services directly responsible :—

(1) Officials or employees of the public services not subject to military obligations ;

(2) Volunteers of both sexes, signing agreements to serve in a civil capacity for the duration of the war with a view to taking part in passive defence.

(3) Non-mobilizable civil recruits who would be called up in pursuance of Article 2 of the law of 31st March, 1938, and would be employed in the passive defence service according to their capabilities, account being taken of their profession ;

(4) Men of the 2nd Reserve not called up for active service. These men would be called up as civil recruits under the conditions laid down in paragraph 3 above, and placed by the military authority at the disposal of the prefects until called to the colours.

The expenses of the preparation and carrying out of passive defence in so far as concerns State installations and services are borne by the State. The State is likewise responsible for passive defence measures of a national character (in particular the safeguarding of means of communication), the planning and construction of public shelters, gas detecting material, medical emergency stations and material ; it shares in the responsibility for measures of local interest which, on account of special circumstances, cannot be borne entirely by the departments and communes.

The following expenses are borne by the departments :—

(1) Preparation of plans for the passive defence of the department, and in particular plans for dispersion of the population ;

(2) Protection of the personnel and material of the departmental services.

The following expenses are borne by the communes :—

(1) Local security services (local civil look-out system, arrangements for giving the alarm and for the extinction of lights) ;
(2) Protection of the personnel and material of the communal services ;
(3) Reinforcement of the communal fire brigade, gas clearance and disinfection services.

With the object of testing the effectiveness of measures of passive defence, exercises may be carried out on the occasion of air defence manœuvres by the joint order of the Ministers for the Interior, War, Marine and Air. Passive defence exercises may also take place at any time by the joint order of the competent authorities.

Any person refusing to conform to the measures established for purposes of the passive defence exercises authorized by the present article, or attempting to obstruct the execution of the said exercises, shall be punished by a fine of 16 to 200 francs. For a further offence the punishment shall be from six days' to one month's imprisonment and a fine of 16 to 200 francs or one or other of these two penalties.

REORGANIZATION OF THE AIR FORCE.—According to the French Press the Air Minister informed the Aeronautical Commission of the Chamber of Deputies on the 20th March, 1935, that he was about to submit a Bill to Parliament asking for an extra budgetary credit of approximately £20,689,650 in order to complete the reorganization of the Air Force before 1936. He said that France could delay no longer.

A total of £41,500,000 had been earmarked for the reorganization, which was to be completed before the beginning of 1937. Of this sum £27,666,000 had already been used, and he asked that, in view of the present political situation, the remaining £13,834,000 should be put at his disposal now, together with a further credit of £6,917,000, in order to intensify aeronautical production and complete the reorganization before the beginning of 1936.

The French Air Minister, M. Denain, informed an Air Defence Conference in Paris on the 2nd April that in a very short time the bombing tonnage of the French Air Service would be trebled and the range of action doubled. Pursuit squadrons were to be reinforced by a new squadron with the most modern aircraft in the world, which would be equipped with a 25 mm. gun.

GERMANY

FORMATION OF AN AIR FORCE.—According to the Berlin correspondent of *The Times* the German air force came into existence officially as from the 1st March. The officers' commissions bear that date, and they now have military rank, with badges and uniforms corresponding to those of the Reichswehr. This step is a direct contravention of the Versailles Treaty.

Details of Germany's new force, so far as they may be obtainable, will be given in next quarter's JOURNAL ; meanwhile see International Situation, p. 407 of this JOURNAL, for the latest official pronouncement by Herr Hitler on the subject, and the reactions of other Powers.

GREECE

AIRCRAFT IN THE REVOLUTION.—See International Situation, p. 413, also General Service Notes, p. 418.

ITALY

AIR ESTIMATES FOR 1935–36.—The Air Estimates for the year 1st July, 1935, to 30th June, 1936, have been defined at lire 839,605,000, showing an increase of lire 130,000,000 over the current year. At the same time the Army Estimates have been reduced by lire 62,000,000, and the Naval have been increased by only 80,000,000. The aggregate national budget has been reduced by almost 1,000,000,000 lire, which gives stress to the importance attached to the Italian Air Force and civil aviation. Lire 839,605,000 is the equivalent of £14,475,948 and £9,126,071, and lire 130,000,000 of £2,241,379 and £1,413,043 at current and par rate of exchange respectively.

AUTOGIRO EXPERIMENTS.—On the 5th January, at the invitation of the Italian Government, a direct control C.30 Autogiro, flown by a British pilot, carried out experiments in landing on and taking off from the cruiser "Fiume." The only modification made for the experiments was the provision of a 33-foot platform near the stern of the ship. From this a series of successful landings and take-offs were made under conditions ranging from the ship being stationary with a 2-knot wind up to the ship steaming 24 knots in the open sea. At each take-off the pilot had to turn immediately in order to avoid the ship's funnel, which was just forward of the platform. Italian officials who witnessed the experiments were stated to be much impressed.

TRAINING OF CHINESE ENGINEERS.—Twenty-five Chinese engineers have arrived in Italy to undergo 3 years' training at the Turin School of Aeronautical Engineering. At the end of their courses they will stay on for several months at various aircraft factories in Italy to gain practical experience.

JAPAN

PROPOSED INTRODUCTION OF AIR DEFENCE LAW.—The Japanese press reports that the War Office, which has been studying the establishment of an extensive anti-air raid net all over the country in concert with the Navy and the Home Offices, has drafted an air defence law for presentation to the Imperial Diet. It is understood that the plan has been under consideration since the air defence manœuvres in August last year.

The proposed Act provides for air defence measures among the non-Government circles. The establishment of an air defence commission in each prefecture, city, town, and village, the training of pickets to watch for enemy planes, and the holding of various anti-air raid manœuvres are included in the draft Act.

YOKOHAMA AIR STATION.—A ceremony inaugurating the construction of Yokohama Air Station was held on 10th November at the new site at Tomioka, a suburb of Yokohama. It is stated that this Air Station, together with the Kisarazu Air Station (also known as Tokyo Bay Air Station), which will also be established shortly, will become two of the most important factors in the air defence of Tokyo in the future.

MAIZURU AIR STATION.—It is reported in the Japanese press that the Construction Department of Maizuru Minor Naval Station has started the construction of the air station by blasting in the Bay of Kurita. August, 1935, has been mentioned as a possible day of completion.

PATRIOTIC PLANES.—The Japan Cement Trade Association and the 16 companies which form the Cement League have presented the Imperial Navy Office with Yen 160,000 to build naval airplanes. With this money two ship-borne type 90 fighters have been completed.

PORTUGAL

Six Shark seaplanes have been ordered from the Blackburn Aeroplane and Motor Co., for the naval air service. It is understood that they will be used mainly for reconnaissance.

SOVIET UNION

DEFENCE MINISTER'S REPORT.—During January, 1935, Tukhachevski, who is Vice-Commissar to Voroshilov, the Minister for Defence, gave his report to the 9th Congress of Soviets. The following is an extract :—

" Since 1931 aviation has increased by 330 per cent. However, numbers are not everything ; range, speed, and weight-carrying capacity have also to be dealt with, especially in the last year or two, when decisive improvements have been effected. Up till then our aviation was average, but recently it has made big strides, thus the speed of our fighters and bombers has been increased by 150–200 per cent., while the radius and weight-lifting capacity of our bombers have risen by nearly 300 per cent., and an increase of speed is really more important than an increase in numbers.

We have also had fewer accidents. The training is better, and the Air Force is trained to work in with other branches—land and sea forces ; in addition, of course, to its own independent activities which in future warfare will be of special importance."

AEROPLANE MADE OF " ELECTRON."—The first aircraft made entirely of electron from a new magnesium alloy said to be lighter than aluminium has just been constructed at No. 1 Factory, Moscow. It is a low-wing monoplane of 12 metres span, fitted with a 200-h.p. radio engine. The maximum speed is 133–140 m.p.h. with a flying weight of 2,640 lbs. The aeroplane, which is a four-seater, has been named " Serge Ordzhonikidze." The tests having been satisfactory, the constructors are now building a seaplane and a light aeroplane also of electron.

WATER GLIDERS.—According to the Moscow *Daily News* (March, 1935), " 80 per cent. of the rivers in the U.S.S.R. are too shallow for anything but water gliders. These gliders can get along with a depth of 10 inches at a rate of 32 m.p.h., whereas a towed barge does barely 3 m.p.h.

Water gliders may also be used in the Black Sea, and in this case they are being designed to carry 100 passengers at a speed of 47 m.p.h. A new type of flying ' water glider ' is being tried out which has so-called ' water wings ' and can make 80 m.p.h. Water glider lines are being organized and will become a big transport feature within the next few years."

REVIEWS OF BOOKS

GENERAL

A History of the Great War, 1914–18. By C. R. M. F. Cruttwell. (Clarendon Press). 15s.

This summary of the War comprises 602 pages, with 34 black and white maps. It deals not only with the operations on sea and on land in all theatres, except Africa, but with diplomatic and political matters—excluding the origin of the War. It appears to have been written to air the writer's views on the War, with which, he admits, some of his friends are " in hearty disagreement," rather than to provide a concise and authoritative narrative.

Mr. Cruttwell does not seem to have a sufficiently wide knowledge of the literature of the War for his purpose. As regards the operations on land, there are so many errors of detail that the reader's confidence in the author is early shaken. It is pretty evident that, although he has read the British Official History, as far as it goes, he has not used the French, German, Italian or Austrian official accounts. For instance, he states that whether or not Pétain issued formal orders on the 24th March, 1918, which left Haig to his fate, " is disputed." The orders in question are given at length in the text of Tome VI of the French Official History, and were available in other French books years ago. One is not surprised, therefore, to find that Mr. Cruttwell has not got the proper sequence of events into his head: he describes the Austro-Russian campaign in Galicia in 1914 before the invasion of Serbia, beginning the account of the latter with the words, " Meanwhile, the Austrians, both by hate and policy, felt themselves obliged to carry out the punitive expedition against Serbia "; and he describes the Italian campaigns in 1915–16 after Passchendale, thus taking no account of the difference of opinion between Falkenhayn and Conrad, the critical point, in 1916, which sent them separately to Verdun and to the Trentino. On the other hand, old and long discredited legends are served up. The account of the battle of the Marne—and other battles too—is incomprehensible, and it is not assisted by the map, which does not mark the position of the B.E.F. One may go so far as to say that he has missed all the important points about this battle.

In his account of Jutland, the author does not spare criticism of the defective disposition which found the Fifth Battle Squadron stationed five miles to the North-West of the Battle Cruisers, to which command they had been sent by Jellicoe as a reinforcement; nor does he fail to point out the lamentable defects in the " Lion's " signal organization—already apparent at the Dogger Bank action—whereby there was further delay in bringing that Squadron up to support, while there was confusion in the ordering of the distribution of the battle cruisers' fire.

The criticism of Jellicoe for not improvising a harassing movement with the Fifth Battle Squadron on the enemy's Western flank, when the main action was joined, is quite unwarrantable. The Commander-in-Chief was not in a position to gauge the potentialities of this Squadron. There was nothing to prevent it harassing the enemy, but, unfortunately, it was handled with singularly little enterprise considering the superior speed of its ships, although they fought most gallantly whenever they were in action.

The allusion to Beatty's request that the van of the battle fleet should follow the battle cruisers and "cut off" the enemy indicates that this writer, like many others, has been misled into believing that this could have had any appreciable bearing on the outcome of the battle. It will suffice to reiterate that the van division was ordered immediately by the C.-in-C. to comply with this request, but that the battle cruisers could not be "followed" because they had lost touch with the battle fleet; moreover, Beatty had not even got the enemy in sight when he proffered the request.

The history emphasizes the amazing neglect of the rear battleships of our line, the "Valiant" and "Malaya," to report sighting the High Sea Fleet breaking through to the Eastward after dark—a tragedy which, more than anything else, deprived us of the fruits of Jutland had the battle been resumed in daylight.

Summarizing the results of the battle, the author has again been misled by critics, long since exposed and discredited, in his allusion to Jellicoe's "rigid centralization." With the exception of the fast Fifth Battle Squadron, independent action by any battleship division would have merely resulted in that division finding itself isolated from the rest of the fleet and to being exterminated. The battle cruisers and light cruiser squadron were, obviously, not restricted by any rigid centralization. The destroyers were, possibly, unduly hampered by their role of an anti-submarine force, but even they had their opportunities which a leader like Stirling seized with avidity.

If the true significance of Jutland has only become apparent within comparatively recent years, the fault must be said to be due to the pitifully inefficient way in which the news of the battle was broadcast to the world at the time and to the gross misrepresentations of the facts which were for so long permitted by the Admiralty after the War. This account would appear to aim at being dispassionate, but there never was a battle so beset with pitfalls for the unprofessional writer as this, the greatest sea encounter of the late war.

The English of this work is not of Oxford standard: some of the sentences are remarkable; for instance, "The enjeopardized German right was outnumbered by four to three, almost as if it formed a great bag thinly stitched at the bottom." The book may entertain, but it should not be regarded as a serious history of the War.

Blake, General at Sea. By C. D. Curtis. With a foreword by Admiral-of-the-Fleet Earl Jellicoe, G.C.B., O.M., G.C.V.O., D.C.L., LL.D. (Barnicott and Pearce, the Wessex Press, Taunton). 10s.

Except for David Hannay's short biography, which appeared some fifty years ago, no life of Blake has been published since Mr. Hepworth Dixon's picturesque but inaccurate work of 1852. This book is, therefore, welcome and the more so because it embodies material which was not available to previous writers. But that material is not easy to come by and Mr. Curtis is, therefore, to be congratulated on his painstaking research.

Few English men of action are better deserving of study than Blake. When he went to the fleet in 1649 it was to a small, sickly, and disorganized service: when he died on board his flagship at sea eight years later that fleet was the mightiest in the world—and not only on the score of its numerical strength, but also for its discipline, its morale and its prestige. That Blake was the master spirit of the Cromwellian Navy emerges clearly from what Mr. Curtis has written, although there is but little comment, deduction or indeed explanation in his pages. Nor

is there any real attempt to delineate character, for a handful of adjectives far from suffice to do this. The narrative of the Dutch War is too overweighted by lengthy quotations from original sources. Nevertheless the book is a conscientious and well documented piece of work which, with its copious notes and appendices, furnishes a mine of information for the student. It is well produced and illustrated, while the foreword by Lord Jellicoe is admirably calculated to make the reader appreciate an observation of Nelson's: "I do not reckon myself equal to Blake."

Sudan Arabic Notebook. By Captain G. S. M. Burton, M.C., attached Sudan Defence Force. (McCorquodale & Co.). 12s. 6d.

British officials of the Sudan Civil Service and officers of the Sudan Defence Force alike will find a vast amount of useful information in this most attractively arranged handbook. The author has evidently mastered his subject very thoroughly; this used to be the exception rather than the rule with the average British Bimbashi, who often found himself placed in command of an Arabic-speaking unit with little or no assistance as to how to pick up a language which is anything but easy to learn. This book will greatly shorten the tedious hours spent with the local or unit interpreter.

It may, however, be suggested that in any further edition there should be included an alphabetical index of the more general words (as opposed to the purely technical words which can easily be found under their respective headings) with references to the pages on which they occur. On taking a "cross section" of the book it is found exceedingly hard to discover the whereabouts of many such general words. With this reserve, the book will serve the dual purpose of phrase book and explanatory dictionary and become of even greater value.

Die Wehrwissenschaft der Gegenwart. Edited by Generalleutenant von Cochenhausen. (Junker und Dünnhaupt, Berlin). 3.80 RM.

This pamphlet of a hundred closely printed pages is a most valuable catalogue *raisonné* of military literature, mainly German, dealing with the various branches of war as it is at present understood. It is divided into seven main parts: war philosophy and psychology; external and internal policy in preparation for war; strategy and tactics of war on land; war on sea and war in the air; military history; technical industries and economics in relation to preparations for war and in war; and geography and geopolitics in relation to war. Under each part a number of the most important books which have appeared recently are shortly analysed by a team of experts. In addition, there is a bibliography of 383 books.

It should be noted that all the books written in anticipation of the next war are by Germans, and that they advocate that all the resources of the nation should be directed towards preparation for it.

NAVAL

Life of Admiral Togo. By Vice-Admiral Viscount Nagayo Ogasawara; translated into English by Jukichi Inouye and Tozo Inouye. (The Sheito Shorin Press, Tokyo). 9s.

No one can fail to be interested, and many naval officers will be enthralled, by the life story of the great Admiral Togo. At the very outset, one is arrested by the account of how, at the age of fifteen, he received his baptism of fire—and that from a British squadron sent, in 1863, to revenge an attack on four Englishmen

by some young samurai. It was this demonstration of sea power, we are told, which decided young Togo to adopt a naval career.

Six years later he was studying English preparatory to entering the training ship " Worcester " in 1871. A voyage in the sailing ship " Hampshire " as an ordinary seaman was followed in 1875 by a course of study in mathematics at Cambridge. He joined the British-built " Hiei "—a wooden ironclad—and returned to Japan in 1878. Promotion to Lieutenant, Lieutenant-Commander, and Vice-Commander followed in rapid succession. He became a full Captain at the age of forty, and was promoted to Flag rank seven years later. In 1904, during the Russo-Japanese war he was made a full Admiral, and in 1913, Admiral of the Fleet. The day before his death, on 30th May, 1934, he was created a Marquis.

Probably no naval officer within the last fifty years has seen so much fighting. His major campaigns were, of course, the war with China of 1894–95, the Boxer rising of 1900, and the war with Russia in 1904–5. During the Great War he was a member of the Council of Marshals and Fleet Admirals ; while his earlier life was made up of many lesser encounters and adventures.

This biography devotes five chapters to Togo's greatest triumph—the Battle of the Sea of Japan, and the course of events is indicated by numerous diagrams. It is written with painstaking attention to detail and, even if the reader finds the tendency to lapse into moralizing a little tedious at times, and here and there the English of the translation is rather quaint, he cannot fail to be inspired by the personality of its subject. Admiral Togo's rugged determination, great courage, wise and skilful leadership, are characteristics which must command admiration, while his pride in his country and its navy were something which, in their depth and sincerity, we would all do well to emulate in these days of internationalist idealism and pacificist sentimentality.

Drake. By Douglas Bell. (Duckworth). 2s.

This is one of the pocket biographies of the " Great Lives " series. It is essentially the type of book to give a boy for a long railway journey or for holiday reading ; but it will serve to recall to any reader those epic days when England was making herself Mistress of the Seas.

Not the least attractive part of a pleasant historical summary is the reference to Drake's loyalty to the Lord Admiral of England, Howard of Effingham, and the latter's appreciation of the fact that his " war staff " was the Captains of his ships headed by his able and gallant second-in-command.

Watch Officer's Guide. By Captain Russell Willson, U.S. Navy. (United States Naval Institute).

This handy little volume, originally published in 1930, deals not only with those duties which essentially appertain to the Officer of the Watch, both at sea and in harbour, but also with the many eventualities which arise at sea and in fleet work.

It is of interest to compare practice and precept in the United States navy with our own. One sees in this publication a lineal descendant of that classic work, Bedford's *Sailors' Pocket Book*.

MILITARY

The Military Engineer in India. Volume II. By Lieut-Colonel E. W. C. Sandes, D.S.O., M.C., R.E. (Ret.). (R.E. Institution). 15s.

This second volume of Colonel Sandes' remarkable work maintains to the full the great interest of its predecessor. It is based on patient and accurate research, whilst retaining a markedly literary form of expression which renders it easy reading. It deals with the civil work of the Royal Engineers in India, just as Volume I was connected with the combatant tasks of the Corps. It covers the same space of time and is treated on much the same lines. But the interest of the book is even greater.

From the earliest days of British rule there was experienced a dearth of civil engineering talent in India. To make good this deficiency the Engineer officers of the three Presidencies' armies were called upon to undertake great public works throughout India. After the assimilation of these Indian corps into the Imperial service, the same work was carried on by the Royal Engineers. Nothing seems to have come amiss to these officers; the scale of very many of the works executed by them during the past hundred years dwarfs most analogous enterprises that have been completed in Europe. It is indeed a magnificent record. Canals, water-supply, drainage, roads, railways, survey and telegraphs, nothing seems to have escaped the attention of the engineer; and in almost every single case, from the construction of the great Ganges canal between 1842 and 1854, by Captain Cautley, down to the most recent survey of telegraph construction work, the results have been both successful and valuable to India. The debt indeed which India owes to the Royal Engineer is indeed great; until the story of these splendid achievements is seen in print, and so admirably and concisely related as is done by Colonel Sandes, it will scarcely be believed. Well might the late Lord Sydenham, himself an ex-Royal Engineer, write: "History records nothing which can approach the British achievement in India, and the world will never see the like again."

The book, moreover, is replete with interesting detail relating to a variety of questions ranging from the casting of the silver-gilt thrones for the Delhi Durbar of 1911 to the construction of the water supply of Aden, in every one of which the resourcefulness and personality of the Engineer stands out. What could be more interesting than the episodes told of Sir Richard Strachey, whose remarkable gifts were responsible for the railway system of India. Nowhere in the Empire has the Engineer accomplished so much.

The War Office. By Hampden Gordon, Assistant Secretary at the War Office. (Putnam). 7s. 6d.

"The Whitehall Series," of which this volume forms part, has been produced with a view to informing the reading public as to the functions performed by the various administrative government departments of Great Britain. It is a good and valuable series, although it obviously suffers from faults inherent in productions of this class: the temptation to self-praise is ever great, whilst the opportunity of defending the work of a government department that has so often been the target for popular sarcasm is too good to be lost. Even so, the book is a readable and informative account of the tasks carried out by the War Office. The author is, of course, well fitted to carry out his task; he has adopted a lighter strain than might have been expected; his figures and statistics are intelligible and never tedious.

The first four chapters deal briefly with the growth of the Regular Army from the earliest times down to 1904. This preliminary survey is necessary since no government department in the world is probably so much the outcome of the historical development of the subject of its administration as is the British War Office. Down to this day the War Department, as it is still called in official papers, bears the impress of its slow growth. Chapter V deals with the momentous Haldane reforms. All these ninety pages are good and clear; though the student will doubtless turn to Wheeler's more complete history of the War Office for further detailed information. The next four chapters, which are highly condensed and packed with fact, deal with the four existing divisions of the Army Staff–General Staff, Adjutant-General, Quartermaster-General, Ordnance, respectively. The succeeding three chapters, which are perhaps the most informative in the book, are concerned with the functions of the civil and financial work of the War Office. The author is here writing from life-long first-hand knowledge. The concluding pages deal with the expansion of the War Office during the Great War and the post-War changes in the Office.

There is little room for finding fault with the author's views as to the work of the military officers at the War Office, but one statement cannot be accepted without cavil: "If the tendency of modern conditions is to leave little room for genius in the field, then efficiency of organization must become the determining factor in war: and that is the task of the General Staff . . ." No: such a statement will scarcely hold water; but this is quite in keeping with the manner of regarding "the War Office" as the controllers of the Army, with the General Staff as its subordinate. But, then, the author's object is to show that every thing is well in the best of Offices!

History of the Great War. Order of Battle of Divisions. Part I—The Regular British Divisions. Compiled by Major A. E. Becke, R.F.A. ((ret.). (H.M.'s Stationery Office). 7s. 6d.

In the Official History of the Great War it was stated that, as the order of battle of divisions might occupy too much space, the composition of these formations would be relegated to a separate publication. This has now been done, and the present volume is the first of the four parts into which the work will be divided. It is most detailed and well arranged for a book of reference. The difficulties facing the compiler in his task will scarcely be realized until it is discovered that, although the first six Regular divisions mobilized with a normal establishment of artillery, the next five Regular divisions mobilized with an artillery establishment that varied in every case.

The book deals with the Regular Army which put into the field three Cavalry divisions, one Guards' division, eleven Infantry divisions. It contains a most useful list of abbreviations and an admirable tabular appendix showing the changes in the composition of the British division throughout the Great War.

The Montagu Musters Book. A.D. 1602–1623. Edited with an introduction by Joan Wake. (The Peterborough Press, Peterborough).

This volume is published by the Northamptonshire Record Society for its own members. Sir Edward Montagu was Commissioner for the Musters in Eastern Northamptonshire during a troubled period; there was first of all the Catholic movement against the Protestant King, James I; this was followed by a rising in 1607 caused by the economic changes that were a source of much distress. Sir Edward's Muster Books throw much light on the local life of the

county whilst preserving many curious letters dealing with the whole business of raising troops at this period. As the Privy Council Registers dating from 1602 to 1613 were destroyed by fire, there is much of real historical value to the student in the present volume.

R. E. Lee. A Biography. By Douglas Southall Freeman. Volumes III and IV. (Scribner's). 15s. each.

These two volumes complete Mr. Freeman's magnificent biography of the great Confederate general. It has been planned on a colossal scale; the amount of research which has gone to its preparation is amazing. Roughly, two-thirds of the work is allotted to the Civil War and one-third to Lee's life before and after. Some readers may feel that the account of Lee's earlier career is somewhat overloaded with unnecessary detail, but no exception should be taken to the exhaustive treatment of his last five years. The unintentional disservice which Lee did his cause by prolonging its existence and so frustrating Lincoln's conciliatory policy was more than atoned for during the years of Reconstruction by the noble example of patience, patriotism and hopefulness, which made him the "idol of the South."

Mr. Freeman's third volume opens with the Gettysburg campaign. He states very clearly the reasons which led Lee to choose to invade Pennsylvania rather than detach part of his army to the relief, direct or indirect, of Vicksburg.

It was no question of "switching" troops from one area to the other and bringing them back in time to counter the enemy's next offensive. Troops detached to the West would be lost to Lee for months. In May, 1863, the Federals were threatening an advance from the West against Richmond and its Southern railways. A still greater danger menaced the capital, if the Army of the Potomac resumed the offensive. It is often forgotten that a few months earlier Burnside's defeat at Fredericksburg had been followed by the "Mud March"; unless Lee snatched the initiative, Hooker might again advance upon Richmond. Lee's losses at Chancellorsville had been very heavy, and Longstreet's two divisions were urgently needed at the front. Even with their addition he could not fight a second battle on the Rappahannock owing to the difficulty of supplying his troops. The choice lay between falling back nearer to Richmond or invading the North. For months past Lee and Jackson had been carefully planning an advance across the Potomac into Pennsylvania. Now Lee had to carry it out without Jackson's help and, owing to Jackson's death, the army had to be reorganized in haste if he was to get his blow in first.

This reorganization Mr. Freeman describes in considerable detail, for there, as he justly observes, lies the explanation of Gettysburg. Lee could not afford to give his army time to settle down in its new formations, and when submitted to the "acid test" its machinery was not in full working order. On not one of the three days of battle was the requisite co-ordination of effort secured. Could Lee have broadened his view of a Commander-in-Chief's functions on the battlefield, things might have gone very differently. But "it is scarcely too much to say that on July 2nd the Army of Northern Virginia was without a commander." When all allowance has been made for his lieutenant's failures, Lee's over-confidence must be held mainly responsible for the defeat. He thought the "other ranks" invincible and demanded the impossible of them. As J. C. Ropes wrote, he failed to "discriminate between successes obtained against poor troops and successes obtained against good troops poorly led."

Mr. Freeman rejects the view that Lee was outgeneralled by Grant, when the

latter crossed the James and nearly captured Petersburg in June, 1864. He proves that Lee was not taken by surprise by a movement, the likelihood of which he clearly foresaw, but that in view of the alternative courses open to Grant he could not strip the north bank of troops—and at this juncture he was unusually short of men, and especially of cavalry—until he definitely knew what corps of the Army of the Potomac (as distinct from the Army of the James) were on the south bank; this precise information he could not get from Beauregard in Petersburg.

In the admirable chapter entitled "The Sword of Robert E. Lee," Mr. Freeman sums up the qualities which "gave eminence to Lee's strategy—his interpretation of military intelligence, his wise devotion to the offensive, his careful choice of position, the exactness of his logistics and his well-considered daring." That Lee suffered from the defects of his virtues, he frankly admits. But had Lee been other than what he was, could he have built up the morale of his army to such a height, that "the men came to believe that whatever he did, was right—that whatever he assigned them, they could accomplish"? Few indeed are the commanders of whom this can be said.

Kriegerisches Italien. By Hugo Schäfer. (Voggenreiter, Potsdam). 2 RM.

This little book contains a full, accurate and up-to-date account of the growth of the Italian Army during the past few years and of the increasing part played by the Fascist Militia in Italian national defence.

REGIMENTAL HISTORIES

The History of the King's Regiment (Liverpool), 1914–1919. By Everard Wyrall. Completed from Chapter XL by Captain W. A. T. Synge. Volume III. 1917–1919. (Edwin Arnold). 7s. 6d.

This volume forms the last and concluding part of this careful history of the King's Regiment in the Great War. It opens with the Third Battle of Ypres (July, 1917) and ends with the Armistice. As the King's put some fifty battalions in the field, the narrative covers virtually the whole of the war in France during this period even if it gives prominence to all important fighting in which the King's was engaged. There are additional chapters on the doings of the regiment in Macedonia, in Russia (17th Battalion), and in India (2nd Battalion). The concluding chapters, owing to the untimely death of Mr. Wyrall, were ably completed by Captain Synge. There is one appendix, a list of casualties suffered by the regiment from January, 1917, to November, 1918.

AIR

War from the Air—Past—Present—Future. By Air Commodore L. E. O. Charlton, C.B., C.M.G., D.S.O. (Nelson). 6s.

The author of this book has evidently drunk deeply of the alluring doctrines expounded, firstly by the late Italian General Douhet, and secondly and more recently by Brigadier-General Groves. In that spirit he traces the growth of Air Forces since the earliest days of aviation; he shows how their development was influenced by the events of the Great War. Much of his matter had already been put forward by General Groves, although it is, in substance at least, based on Volume IV of our own official Air history. In dealing with the British air activities he does full justice to the excellent work done by the Royal Naval Air Service, but he is none too flattering in his criticism of the air policy pursued at General Headquarters during the War. It is a pity that Air Commodore Charlton should

seem to be animated by a feeling of bitterness in writing of these matters. His own personal career and the extent of his reading are sufficient guarantees that he knows his subject. But the acrid tone spoils his case, even if it does not shake the reader's belief in it.

The last section of the book deals with the future. Beginning with an analysis of Douhet's doctrine, he claims that the aerial warfare of the future has rendered obsolete nearly all accepted doctrines of war. Here again one is tempted to take the view that the author, carried away by the intensity of his feelings, is liable to exaggeration. In particular, this seems to be the case with regard to the bombing of great cities. The best opinions are as yet still divided as to how far the annihilation of a capital city is feasible. We are prepared to admit that the effects of the Gotha raids of 1917 over London have been seriously underestimated : there can be no question of that fact. But on the credit side of the defence, much could be adduced; neither should it be overlooked that it was the fear of reprisals that finally safeguarded London against further attack as much as the improved efficiency of the passive defences. This fear may yet prevail in the future.

It is all to the good that this question of air warfare should be ventilated in this manner, and in a clever book such as this. But before coming to definite conclusions, other opinions besides those of Air Commodore Charlton need be heard. General Douhet's doctrine is unquestionably an important and grave departure in our present conceptions of war.[1]; but it needs to be examined carefully in order to gauge its true value and significance to Great Britain.

La Doctrine de Guerre du General Douhet. By Colonel Vauthier. (Berger-Levrault, Paris). 18 fcs. (French).

This remarkable and timely work sets out the doctrine of war enunciated during the past few years by the Italian General Douhet. His opinions may well be regarded as the source from which has sprung the modern Italian theory of aerial war. Marshal Pétain, who contributes an introduction to the work, stresses its importance on the grounds that Douhet's writings have hitherto remained all too little known in France. For several years, moreover, Douhet's work gave rise to an acute controversy in Italy as to the scope and significance of aerial armaments : but France remained deaf to all these discussions. In this book this important subject is clearly summarized.

Colonel Vauthier not only gives an account of Douhet's writings, but also analyses all the objections that were raised in answer thereto, both in Italy and in France. It is this part of the book which will prove of greatest interest to British readers, since, as indeed Colonel Vauthier points out, Douhet's doctrine of carrying the offensive into the air whilst remaining on the defensive on land is more particularly applicable to Italy.

Whatever impression may be formed by the study of this volume, it must be admitted that the case for aerial armaments has never been more strikingly put forward than by this Italian writer. In any case, in Marshal Pétain's words, it would be rash " to deride as a visionary and dreamer the man who may later come to be regarded as a true prophet." This study of Douhet's voluminous writings, which have been ably condensed, digested and criticized by Colonel Vauthier, needs attention and careful study, for the entire problem of the full scope and importance of aerial war is not yet understood. It is easy to exaggerate its importance, just as it is possible to minimize its true potentialities.

[1] See also the review of Colonel Vauthier's book which follows.

ADDITIONS TO THE LIBRARY

GENERAL

THE QUESTION OF THE STRAITS. By P. P. Graves. 10s. 6d. 8vo. (Ernest Benn, Ltd.).

OUR OWN TIMES, 1913–1934. Vol. I. By S. King-Hall. 10s. 6d. 8vo. (Ivor Nicholson and Watson, Ltd.).

SERVICE ATHLETICS. By Major the Hon. W. S. P. Alexander and Major I. E. F. Campbell. 4s. 8vo. (The Technical Press, Ltd.). Presented by the Publishers.

A HISTORY OF EUROPE. Vol. I. By the Rt. Hon. H. A. L. Fisher. 18s. 8vo. (Eyre and Spottiswoode).

RETREAT FROM GLORY. By R. H. Bruce Lockhart. 10s. 6d. 8vo. (Putnam).

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LIFE OF ADMIRAL TOGO. By Viscount S. N. Ogasawara. Translated by Jukichi and Tozo Inouye. 9s. 8vo. (Tokyo). Presented by Captain Arata Oka, Japanese Naval Attaché).

R. E. LEE. Vols. III and IV. By D. S. Freeman. 30s. per set. 8vo. (Scribner). Presented by the Publisher.

WHEN BRITAIN GOES TO WAR. By B. H. Liddell Hart. 8s. 6d. 8vo. (Faber and Faber).

WARREN HASTINGS. By A. Mervyn Davies. 25s. 8vo. (Ivor Nicholson and Watson).

SECURITY ?—A STUDY OF OUR MILITARY POSITION. By Major-General H. Rowan-Robinson. 5s. 8vo. (Methuen & Co., Ltd.). Presented by the Publisher.

HINDENBURG. By Emil Ludwig. 12s. 6d. 8vo. (Heinemann).

NAVAL

THE TANGIER PAPERS OF SAMUEL PEPYS. Edited by Edwin Chappell. 8vo. (Navy Records Society). Vol. LXXIII.

WATCH OFFICERS' GUIDE. By Captain Russell Willson, U.S.N. 8vo. (United States Naval Institute, Annapolis).

MILITARY

HISTORY OF THE GREAT WAR—MILITARY OPERATIONS, FRANCE AND BELGIUM, 1918—THE GERMAN MARCH OFFENSIVE AND ITS PRELIMINARIES. Compiled by Brigadier-General Sir James Edmonds. Text 12s. 6d. Appendices 6s. 6d. Maps 5s. 6d. 8vo. (Macmillan & Co.).

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LE 3e CORPS D'ARMÉE DE CHARLEROI À LA MARNE. By General Gabriel Rouguerol. 4s. 3d. 8vo. (Berger-Levrault, Paris).

THE MILITARY ENGINEER IN INDIA. Vol. II. By Lieut.-Colonel E. W. C. Sandes. 15s. 8vo. (The Institution of Royal Engineers, Chatham). Presented by the Publisher.

HISTORY OF THE GREAT WAR—ORDER OF BATTLE OF DIVISIONS. PART I. THE REGULAR BRITISH DIVISIONS. Compiled by Major A. F. Becke. 7s. 6d. 8vo. (H.M. Stationery Office). Presented by the Publishers.

THE JOURNAL OF AN ARMY SURGEON (40TH REGIMENT) DURING THE PENINSULAR WAR. By C. Boutflower. 8vo. N.P. Presented by Captain E. C. Hopkinson, M.C.

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THE LAND-LOCKED LAKE. By Lieut.-Colonel A. A. Hanbury-Sparrow. 7s. 6d. 8vo. (A. Barker, Ltd).

REGIMENTAL HISTORIES

THE HISTORY OF THE SCOTS GUARDS. FROM THE CREATION OF THE REGIMENT TO THE EVE OF THE GREAT WAR. By Major-General Sir F. Maurice. 2 Vols. 42s. 8vo. (Chatto and Windus). Presented by the Regiment.

THE LONG RIDE—A SHORT HISTORY OF THE 17TH DUKE OF YORK'S ROYAL CANADIAN HUSSARS. By Major Harwood Steele. 8vo.

THE KING'S REGIMENT (LIVERPOOL 1914–1919). Vol. III. By E. Wyrall and Captain W. A. T. Synge. 7s. 6d. 8vo. (Edward Arnold & Co.). Presented by the Publishers.

THE HISTORY OF THE ARGYLL AND SUTHERLAND HIGHLANDERS, 1794–1930. 8vo. (M'Lagan and Cumming, Edinburgh). Presented by Captain G. I. Malcolm.

AIR

WAR FROM THE AIR—PAST, PRESENT AND FUTURE. By L. E. O. Charlton. 6s. 8vo. (Nelson and Sons). Presented by the Publishers.

ROYAL UNITED SERVICE INSTITUTION

Hundred-and-Fourth Anniversary Meeting

TUESDAY, 5TH MARCH, 1935.

GENERAL SIR ROBERT WHIGHAM, G.C.B., K.C.M.G., D.S.O., Chairman of the Council, in the Chair.

THE SECRETARY (Captain E. Altham, C.B., R.N.): Notices of this Meeting were duly inserted in the JOURNAL of the Institution, and also in *The Times* for 25th February of this year.

ANNUAL REPORT FOR 1934

The Council have the honour to present their Annual Report for the year 1934.

VISIT OF H.R.H. THE DUKE OF YORK

H.R.H. The Duke of York visited the Institution on 19th December to preside at a General Council Meeting of King George's Fund for Sailors, which was held in the theatre. He was received by Admiral of the Fleet The Earl Jellicoe, O.M., G.C.B., G.C.V.O., LL.D., representing the Council. Subsequently he was shown round the Museum by Captain E. Altham, C.B., R.N., Secretary and Chief Executive Officer.

VICE-PRESIDENTS

Field-Marshal The Viscount Allenby, G.C.B., G.C.M.G., G.C.V.O., D.C.L., LL.D., and Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O., completed their term of office and were re-elected Vice-Presidents of the Institution.

COUNCIL

General Sir Felix Ready, K.C.B., C.S.I., C.M.G., D.S.O., has been elected to the Council in succession to Lieutenant-General Sir J. R. E. Charles, K.C.B., C.M.G., D.S.O.

The following Members of the Council, having completed three years' service, retire, but offer themselves for re-election :—

ROYAL NAVY

Rear-Admiral B. W. M. Fairbairn, C.B.E.

ROYAL MARINES

Brigadier W. W. Godfrey, C.B., C.M.G., A.D.C.

ROYAL NAVAL VOLUNTEER RESERVE

Commodore The Earl Howe, C.B.E., V.D.

REGULAR ARMY

Colonel G. E. C. Rasch, D.S.O.
General Sir Robert Whigham, G.C.B., K.C.M.G., D.S.O.

TERRITORIAL ARMY

Colonel F. D. Samuel, D.S.O., T.D.
Colonel B. Abel Smith, D.S.O., M.C., T.D., A.D.C.

REPRESENTATIVE MEMBERS

Major-General C. P. Heywood, C.B., C.M.G., D.S.O., has succeeded Lieutenant-General Sir Ivo L. B. Vesey, K.B.E., C.B., C.M.G., D.S.O., as War Office Representative on the Council; and Air Commodore A. S. Barratt, C.M.G., M.C., *p.s.a.*, succeeds Air Vice-Marshal Sir Edgar R. Ludlow-Hewitt, K.C.B., C.M.G., M.C., as Air Ministry Representative on the Council.

EX-OFFICIO MEMBERS

Vice-Admiral R. M. Colvin, C.B., C.B.E., has succeeded Vice-Admiral Sir B. E. Domvile, K.B.E., C.B., C.M.G., as an ex-officio Member of the Council on taking up the appointment of President of the Royal Naval College, Greenwich.

Captain B. C. Watson, D.S.O., R.N., has succeeded Captain R. H. T. Raikes, D.S.O., R.N., on taking up the appointment of Director of the Royal Naval Staff College, Greenwich.

Major-General R. H. Haining, D.S.O., *p.s.c.*, succeeds Admiral Sir L. G. Preston, K.C.B., on taking up the appointment of Commandant of the Imperial Defence College.

HONORARY MEMBERS

Major-General H. C. Thacker, C.B., C.M.G., D.S.O., has accepted service as an Honorary Member of the Council representing Canada, in succession to the late General Sir A. W. Currie, G.C.M.G., K.C.B.

STAFF

The Council have appointed Paymaster Lieutenant-Commander J. Hogg, R.N., as Assistant Librarian and Fourth Officer of the Institution.

MEMBERSHIP

The total number of Members on the roll at the end of 1934 was 5,594, as compared with 5,656 in 1933. During the past year 198 Members joined the Institution, as compared with 196 in 1933. There were 133 withdrawals, as compared with 136 in 1933; 33 Life Members and 58 Annual Members died, and 36 Members were struck off for being two years in arrear with their subscriptions.

The details of Members joining are as follows:—

Regular Army	113
Royal Navy	32
Royal Air Force	15
Indian Army	13
Territorial Army	11
Royal Marines	6
Dominion and Colonial Forces	4
Royal Naval Volunteer Reserve	3
Royal Indian Marine	1
	198

This shows there is a net decrease of 62, but as the loss of Life Members does not affect the financial aspect, the financial loss on the year is 29.

FINANCE

Investments.—The Finance Committee carefully scrutinised the Institution's Investments in February, 1934, and, acting on their advice, the Council approved that the whole of the 3½% War, 4% Funding, and 3½% Conversion Stocks should be sold and the proceeds re-invested in 3% Conversion (1948-53). This was done with the object of conserving Capital. The original cost of the Investments sold was £10,398 1s. 5d.; they realised £14,031 12s. 0d., and purchased £14,080 3% Conversion Loan.

During the past year the Institution's Investments have increased in value by £1,261 2s. 9d. This figure is made up by an appreciation of £1,070 19s. 3d. in the market value of the 3½% India Stock and the 3% Conversion Loan, together with a profit of £190 3s. 6d. realised on the sales of Investments during the year.

Capital Expenditure.—As stated in last year's Annual Report, the Council decided that Special Expenditure incurred in connection with the re-cataloguing of the Library and the printing of a new edition of the Museum Catalogue should be met out of Capital. Up to date Investments have been realised to provide £800 for this purpose. The work of re-cataloguing the Library has been completed at a total cost of £464 12s. 8d. A third and final instalment of £160 is due for the Museum Catalogue. The total expenditure on these two items will have amounted to £945 7s. 8d., which falls well within the £1,000 saved out of income and invested in 1930.

Life Subscription Fund.—This Fund has steadily increased since 1929 when it was decided that the Current Account should only be credited with the equivalent to an annual subscription in respect of each Life Member until his subscription was exhausted. It now amounts to £810 12s. 1d.

Legacy.—The Institution is indebted to the late Lieutenant-Colonel F. J. Ashburner for a legacy of £250, to be devoted to "general purposes." Half this sum was invested in 3 per cent. Conversion Loan and the remaining £125 placed at the disposal of the Museum and General Purposes Committee.

Museum Collection.—The value of the Museum Collection has been carefully checked and revised, and the figure shown on the Balance Sheet now agrees

with the amount for which the exhibits were covered by insurance on 31st December, 1934.

Receipts

The following is a comparison of receipts under the principal headings :—

	1934			1933		
	£	s.	d.	£	s.	d.
Annual Subscriptions	5,044	4	6	5,070	0	10
Entrance Fees	147	0	0	139	13	0
Life Subscriptions	88	7	0	88	6	0
Museum Takings	1,512	0	6	1,385	1	6
Journal Sales	735	8	10	713	5	10
Dividends and Interest	391	17	0	617	19	0

The Museum takings show an increase of £127 19s. 0d., which is attributable partly to the general return towards prosperity and partly to the attraction of the Naval Polar, Wellington, and Aircraft Model Special Exhibitions which have been held during the year.

Experience has shown that the second cheap afternoon, instituted in May, 1933, brings a considerably greater number of visitors to the Museum on Wednesday afternoons and does not adversely affect the receipts. It has, therefore, been continued throughout 1934.

The Journal sales show an increase of £22 3s. 0d. on the previous year.

The year's receipts have suffered a loss of £226 2s. 0d. in dividends and interest. This has been due chiefly to the sale of Investments, the lower rate of interest on the new Investments, and the fact that certain Investments were sold "cum dividend." As regards the latter, no adjustment has been made in respect of accrued interest included in the selling price, and the resultant loss to revenue from this cause amounted to £107 1s. 6d. (gross). There was, of course, a corresponding increase to invested capital.

A comparison of the details of other receipts with those in 1933 is shown in the Revenue Account.

Expenditure

Excluding Special Expenditure, already dealt with, the Account shows a saving of £472 8s. 1d., as compared with expenditure in 1933. The principal economy effected has been in connection with the Museum, but reference to the comparative figures in the Revenue Account will show that there has been saving under most headings. In no case, however, has this detracted from the facilities which the Institution affords to Members.

Before providing for Special Expenditure, the year's working shows a surplus of £110 8s. 1d., which, in all the circumstances, is satisfactory.

JOURNAL

The policy which the Council have adopted of giving a liberal interpretation to the Institution's Royal Charter is reflected in the contents of the Journal. "The Promotion and Advancement of Naval and Military Science and Literature" have long since been held to include all matters relating to the Royal Air Force, and every aspect of aviation which may have a bearing on

the functions of all three Services; but they are now taken as covering all those international events which affect the relations of the great Powers or which might call for any changes in the policy or strategy of our Imperial defence. Scientific progress as it might influence the development of foreign navies, armies, and air forces is continually scrutinised, and the latest available information about those forces is given to the readers of the JOURNAL.

It is one of the aims of the JOURNAL to provide sound guidance on Service questions generally. The Institution exists for free and frank discussion of topics of interest to its Members, and opportunities are provided for the exchange of views in the lecture theatre and in the Correspondence pages; but it is desirable that there should be such a medium as the JOURNAL for countering misconceptions which from time to time arise due to publicity being given in the Press to ill-informed opinions or to actual misstatements of fact regarding Service matters. To this end, lectures and articles are published which have been contributed by officers with special knowledge of such controversial subjects; it is hoped that these will assist readers when they are taking part in discussions on them, whether within or without the Service.

In view of the decision of the Army Council to review the honorary distinctions in commemoration of operations at present granted to the various units of the Army, a number of articles have been published in the JOURNAL during 1934 dealing with "Battle Honours," which it is hoped may be helpful to regiments in preferring their claims.

The Council continue to be indebted to the Naval, General and Air Staffs for their valuable co-operation in compiling the professional notes, and also to the President of the Royal Naval College, Greenwich; the Commandants of the Imperial Defence College, the Staff College, Camberley, and the Royal Air Force Staff College and the Director of the Royal Naval Staff College for their ready assistance at all times. The thanks of the Institution are also due to all those who have contributed lectures and articles to the JOURNAL.

LIBRARY

As reported last year, the Council secured the services of Mr. G. W. Ellison from the London University to recatalogue the whole of the books in the Library and reorganize the lending system. This very extensive work has now been completed, and it is anticipated that the value of the Library to Members will be appreciably enhanced.

The Council have also considered it desirable that there should be an Assistant Librarian who, under the Librarian, shall be specially charged with maintaining the new system in good order and supervising the Lending Library. They have appointed Paymaster Lieutenant-Commander J. Hogg, R.N., to this post. As from the end of 1934, the duties of Senior Library Clerk are merged in those of the Assistant Librarian, and G. Sheppard who for many years has rendered valuable service to the Institution in the former capacity has been superannuated with a pension.

Members are particularly asked to draw the attention of officers who have not yet joined the Institution to the facilities afforded by the Lending Library. Those studying for the Staff College or Promotion examinations, entering for any Service Essay Competition, or wishing to read up some particular period of history, will find that, by borrowing up to four volumes at a time from the

Institution, they can save themselves the trouble and expense of obtaining the books they require elsewhere.

During 1934 one hundred and sixty new books were added to the Library; this number does not include either additional copies of new books or of books already in the Library which had to be purchased to meet the ever-growing demand.

MUSEUM

The number of visitors who passed the turnstile during 1934 was 41,834, as compared with 39,234 in 1933. These figures include members of the Fighting Services and Police in uniform, parties from elementary schools, Scouts, Guides, etc., all of whom are admitted free. They also include friends of Members admitted by ticket, but not those admitted by Members personally through the Institution entrance. The latter numbered 501 during 1934 as compared with 512 in 1933.

The following is a comparison of the "free admittance" figures :—

	1934	1933
R.U.S.I. Members' tickets	139	179
Fighting Services	2,015	1,818
Schools	1,070	1,322
Scouts and Guides	867	1,051

The number of visitors who paid for admission in 1934 was 37,743, as compared with 34,864 in 1933. The average number of visitors per day when the Museum was open was 138.

Special Exhibitions

The Naval Polar Exhibition, which proved an attraction during the Christmas holidays of 1933–34, was continued until the Museum was closed for the annual cleaning early in March.

The Museum re-opened with a Wellington Exhibition, which included relics and accoutrements relating to the Great Duke, his Generals and campaigns; also a selection of pictures of the period from the Crookshank Collection. The Institution's own considerable collection of exhibits was augmented by other relics kindly lent by His Grace the late (fourth) Duke of Wellington; Colonel C. de W. Crookshank, M.P.; Colonel R. Q. Craufurd, D.S.O.; Mr. Philip Guedalla; Miss Lowry Cole; and Mrs. E. E. Cope. This Exhibition was continued until the latter part of May.

In June a Special Exhibition of Aircraft Models was opened. These were arranged in eight dioramic scenes, designed by Captain E. Altham, R.N. and executed by Miss C. Mourilyan. They depicted respectively :—Early Experimental Types and Pioneer Aircraft; Royal Flying Corps; Royal Naval Air Service; Fleet Air Arm; Coastal and Army Co-operation Types; Bombers and Fighters; and the Development of Imperial Air Communications. The greater proportion of the aircraft models were kindly lent by the Air Ministry in conjunction with the Department of Overseas Trade, but the considerable collection of aircraft models now possessed by the Institution was also utilised. The Exhibition was visited by the Most Hon. The Marquess of Londonderry, K.G., M.V.O., Secretary of State for Air, and Air Chief Marshal Sir Edward

L. Ellington, K.C.B., C.M.G., C.B.E., Chief of the Air Staff. It has been continued during the Christmas holidays of 1934–35.

Loans to The Scots Guards Exhibition from the Museum

A number of articles were lent from the Royal United Service Museum to the Scots Guards Exhibition, organised by that Regiment in December in aid of unemployed ex-Guardsmen and Regimental Charities. By permission of the War Office, a selection of the Crookshank pictures was also lent to the Exhibition.

New Exhibits

The Institution is indebted to Her Majesty the Queen for two pieces of old Staffordshire ware, one being a mug with the head of the Duke of Wellington, and the other a statuette of General Havelock.

H.R.H. The Prince of Wales has presented two valuable additions to the collection of historic head-dresses; these are a cap worn by Field-Marshal Sir Douglas Haig and a kepi worn by Marshal Foch during the Great War.

H.R.H. The Princess Royal has presented a pouch box of the 15th Hussars, worn up to 1914.

A unique gift of great historic interest has been a set of Nelson's baby clothes, including his first shirt and infant's bonnet, presented by Mrs. J. A. Barratt.

The Institution is also indebted to generous donors for 187 other gifts to the Museum. These include thirty Indian Medals and Orders, presented by the Secretary of State for India; twenty medals presented by Colonel A. S. Bates, and twenty-four other medals which have been added to the collection during the year. Major H. G. Parkyn, the Rev. G. Hawkes Field and other donors have made numerous additions to the collection of badges and buttons. Other new exhibits include the following:—

Naval.—A beautiful model of H.M.S. "Sans Pareil," captured from the French on 1st June, 1794; presented by Mrs. Hart Dyke. The sword surrendered to A. Morris of H.M.S. "Nymph" by the Second Captain of the French frigate "La Cleopatre," 17th June, 1793; presented by the Rev. M. C. F. Morris. A ship's badge of H.M.S. "Hood," 1934; presented by the Commanding Officer.

Military.—Double-barrelled rifle (pattern for the Jacob's rifle); presented by Field-Marshal Sir Claud Jacob. A very fine head-dress of the Royal Horse Guards, Waterloo period; presented by the Rev. P. Sumner.

Air.—Model of one of their Mark IV Sidestrand aircraft; presented by Messrs. Boulton & Paul. Model of a "Seal" aircraft; presented by the Fairey Aviation Co. A set of twenty-nine enlargements of aerial photographs; presented by "Flight." Model of an autogiro—C.30 type; presented by the Cierva Autogiro Co. Model of a Handley-Page "Hyderabad" night bomber; presented by C. B. Elliot, Esq.

ROYAL UNITED SERVICE INSTITUTION.

BALANCE SHEET, 31ST DECEMBER, 1934.

DR. CR.

	£ s. d.	£ s. d.
To ACCUMULATED FUND—		
Excess of Assets over Liabilities, as at 31st December, 1933	91,704 9 0	
Add: Additions to Museum Exhibits during the year, including adjustment of values on re-cataloguing the Collection, per contra £5,047 0 6		
Less: Withdrawals, per contra 82 0 0	4,965 0 6	
Legacy from the late Lieut.-Colonel F. J. Ashburner .. 250 0 0		
Less: Proportion allocated to Museum and General Purposes 125 0 0	125 0 0	
Appreciation of Investments since 31st December, 1933, including profit realised on sales during year	1,261 2 9	
	98,055 12 3	
Less: Revenue Account—Balance per annexed Account	374 18 3	97,680 14 0
" MUSEUM EXHIBITS PURCHASE FUND ..		31 12 1
" PROPORTION OF LEGACY FROM THE LATE LIEUT.-COLONEL F. J. ASHBURNER:		
Allocated to Museum and General Purposes ..	125 0 0	
Less: Expenditure to date	89 6 6	
		35 13 6
" LEASEHOLD REDEMPTION FUND		3,663 5 1
" LIFE SUBSCRIPTION FUND		810 12 1
" SUBSCRIPTIONS, ETC., PAID IN ADVANCE		204 16 6
" CREDITORS		1,086 10 2
BERTRAM ABEL SMITH, *Chairman, Finance Committee.*		
E. ALTHAM, *Secretary.*		
		£103,513 3 5

	£ s. d.	£ s. d.
By LEASEHOLD BUILDING—Whitehall, S.W.1, at Cost (covered by Insurance for £40,000) ..		23,101 16 8
" FURNITURE, FIXTURES, FITTINGS, BOOKS, MAPS, CHARTS, etc. (as valued for Insurance at 31st December, 1926, with subsequent additions at cost)		10,229 0 6
" MUSEUM EXHIBITS, etc. (excluding Loan Collection)—		
As at 31st December, 1933	43,347 6 6	
Additions during the year, including adjustment of values on re-cataloguing the Collection	5,047 0 6	
	48,394 7 0	
Deduct: Withdrawals during the year ..	82 0 0	48,312 7 0
(NOTE: The Museum Exhibits, including Loan Collection, are covered by Insurance for £58,242 16s. 0d.).		
" LEASEHOLD REDEMPTION FUND—		
Premiums paid to 31st December, 1933, on Insurance Policies for £23,100 expiring October, 1972	3,597 1 6	
Add: Premium paid during year	66 3 7	3,663 5 1
" LIFE SUBSCRIPTION FUND—		
£698 16s. 10d. 2½% Conversion Loan, 1944-49, at market price, 31st December, 1934 ..	714 11 4	
Cash at Bank on Deposit Account	96 0 9	810 12 1
" INVESTMENTS at Market Price, 31st December, 1934—		
£1,951 0s. 8d. 3½% India Stock	1,931 10 6	
£14,202 16s. 0d. 3% Conversion Loan ..	15,019 9 3	16,950 19 9
" DEBTORS AND AMOUNTS PAID IN ADVANCE		388 13 10
" CASH AT BANK AND IN HAND		56 8 6
		£103,513 3 5

TO THE MEMBERS OF THE ROYAL UNITED SERVICE INSTITUTION.

We have audited the above Balance Sheet dated 31st December, 1934, and have obtained all the information and explanations we have required. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the Institution's affairs according to the best of our information and the explanations given to us and as shown by the books of the Institution.

ALDERMAN'S HOUSE,
BISHOPSGATE, LONDON, E.C.2.
11th February, 1935.

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

BRACKENBURY MEMORIAL FUND.

DR. 31st DECEMBER, 1934. CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1933 :—			By Expenditure on Books, etc...		22 17 10
Cash at Bankers	18 13 0		" Royal United Service Institution— Administration Fee		1 1 0
Investment at Market Price	426 6 3		" Balance of Fund at 31st December, 1934 :—		
		444 19 3	Cash at Bankers	9 8 10	
" Dividends Received, Gross		14 14 8	Investment at Market Price : £421 1s. 0d. 3½% War Loan	457 17 10	
" Appreciation of Investment to Market Price at 31st December, 1934		31 11 7			467 6 8
		£491 5 6			£491 5 6

We have audited the above Statement of the Brackenbury Memorial Fund for the year ended 31st December 1934, and certify the same to be correct.

ALDERMAN'S HOUSE,
BISHOPSGATE, LONDON, E.C.2.
11th February, 1935.

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

EARDLEY-WILMOT MEDAL FUND.

DR. 31st DECEMBER, 1934. CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1933 :—			By Balance of Fund at 31st December, 1934 :—		
Cash at Bankers	20 0 9		Cash at Bankers	25 0 9	
Investment at Market Price	116 10 0		Investment at Market Price : £100 5% Conversion Loan, 1944-64	123 15 0	
		136 10 9			148 15 9
" Dividends Received, Gross		5 0 0			
" Appreciation of Investment to Market Price at 31st December, 1934		7 5 0			
		£148 15 9			£148 15 9

We have audited the above Statement of the Eardley-Wilmot Medal Fund for the year ended 31st December, 1934, and certify the same to be correct.

ALDERMAN'S HOUSE,
BISHOPSGATE, LONDON, E.C.2.
11th February, 1935.

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

CHESNEY MEMORIAL MEDAL FUND.

DR. — 31st DECEMBER, 1934. — CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1933 :—			By Balance of Fund at 31st December, 1934 :—		
Cash at Bankers	3 4 9		Cash at Bankers	11 7 9	
Investment at Market Price	201 5 0		Investment at Market Price :		
		204 9 9	£230 Bengal & North Western Railway 3½% Preference Stock	211 12 0	
" Dividends Received, less Tax		7 0 10			222 19 9
" Income Tax Recovered in respect of year 1933-34		1 2 2			
" Appreciation of Investment to Market Price at 31st December, 1934		10 7 0			
		£222 19 9			£222 19 9

We have audited the above Statement of the Chesney Memorial Medal Fund for the year ended 31st December, 1934, and certify the same to be correct.

ALDERMAN'S HOUSE,
BISHOPSGATE, LONDON, E.C.2.
11th February, 1935.

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

TRENCH GASCOIGNE PRIZE FUND.

DR. — 31st DECEMBER, 1934. — CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1933 :—			By First Prize Essay, 1933	31 10 0	
Cash at Bankers	89 18 0		" Second Prize Essay, 1933	21 0 0	
Investments at Market Price	1,553 12 2		" Third Prize Essay, 1933	10 10 0	
		1,643 10 2			63 0 0
" Dividends Received, less Tax		42 11 10	" Balance of Fund at 31st December, 1934 :—		
" Dividends Received, Gross		3 10 0	Cash at Bankers	86 19 2	
" Income Tax Recovered in respect of year 1933-34		13 19 4	Investments at Market Prices :		
" Appreciation of Investments to Market Price at 31st December, 1934		137 16 10	£1,862 London & North Eastern Railway 3% Debenture Stock	1,582 14 0	
			£100 3½% War Loan	108 15 0	
					1,778 8 2
		£1,841 8 2			£1,841 8 2

We have audited the above Statement of the Trench Gascoigne Prize Fund for the year ended 31st December, 1934, and certify the same to be correct.

ALDERMAN'S HOUSE,
BISHOPSGATE, LONDON, E.C.2.
11th February, 1935.

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

DR. **REVENUE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1934.** CR.

1933 £ s. d.		£ s. d.	£ s. d.	1933 £ s. d.		£ s. d.	£ s. d.
2,239 8 0	To Salaries	2,265 8 0		5,070 0 10	By Members' Subscriptions Received	5,044 4 6	
2,021 2 11	" Wages and National Insurance	2,005 7 9		4 11 0	" Voluntary Extra Subscriptions	5 17 0	
60 1 6	" Attendants' Clothing	33 14 9		88 6 0	" Life Subscriptions—Amount brought to Credit	88 7 0	
91 0 0	" Pensions	104 0 0		139 13 0	" Entrance Fees	147 0 0	
			4,408 10 6				5,285 8 6
321 4 4	" Museum Repairs, Sundries and Special Exhibitions		101 13 4	1,385 1 6	" Admissions to Museum	1,512 0 6	
1,466 1 5	" Journal Printing	1,390 10 0		58 4 5	" Sales of Museum Catalogues and Pamphlets	56 11 8	
347 8 5	" Journal Postage	321 9 0					1,568 12 2
251 19 0	" Literary Services	267 11 0		713 5 10	" Sales of Journal	735 8 10	
40 7 8	" Shorthand Notes	42 1 2		274 2 10	" Advertisements in Journal	280 17 3	
			2,021 11 2				1,016 6 1
142 14 10	" Library Purchase and Binding of Books	125 10 2		10 10 8	" Advertisements in Museum Catalogue	—	
53 9 3	" Periodicals and Newspapers	54 12 6		40 8 6	" Profit on Repairing Regimental Colours, etc.	42 17 9	
			180 2 8	6 19 9	" Miscellaneous Receipts	23 9 6	
16 16 6	" Advertising	16 19 0					66 7 3
11 0 6	" Lecture Expenses	14 3 6		281 5 4	" Rent of Lecture Theatre and Offices, etc.		263 7 0
			31 2 6	617 19 0	" Dividends and Interest Received		391 17 0
580 0 0	" Ground Rent	580 0 0		670 0 0	" Government Grants		670 0 0
60 14 6	" Water Rate	60 14 6					
537 15 5	" General Rates	532 11 6					
95 3 10	" Insurance	91 19 7					
			1,265 5 7				
120 16 11	" Fuel	114 15 0					
270 7 0	" Lighting	228 19 7					
119 18 2	" General Repairs	98 8 9					
49 10 0	" Restoration of Pictures	—					
115 8 10	" House Sundries and Expenses	95 19 6					
			538 2 10				
52 10 0	" Audit Fee, 1934	52 10 0					
80 14 7	" Postages, Telegrams, etc.	73 17 6					
213 11 6	" Printing and Stationery	190 1 5					
37 12 8	" Telephone	40 13 8					
—	" Travelling Expenses	4 3 9					
			361 6 4				
145 8 2	" Contribution to Staff Pension Scheme		162 16 5				
66 3 7	" Leasehold Redemption Fund		66 3 7				
15 8 6	" Gold Medal for R.U.S.I. Prize Essay, 1933		14 15 0				
263 9 4	" Balance carried down		110 8 1				
(*Deficit*)							
£9,360 8 8			£9,261 18 0	£9,360 8 8			£9,261 18 0
	To SPECIAL EXPENDITURE—			1933			
1933				263 9 4	By Balance brought down, being excess of Income		
139 6 4	Salaries and Expenses in connection with re-cataloguing Lending Library	325 6 4		(*Deficit*)	over Expenditure for the year		110 8 1
	8th Edition of Museum Catalogue—Final Instal-			572 13 6	" Balance carried to Balance Sheet		374 18 3
160 0 0	ment	160 0 0					
9 17 10	(Additional Electrical wiring in Crypt—balance)	—					
			485 6 4				
£309 4 2			£485 6 4	£309 4 2			£485 6 4

CHAIRMAN'S ADDRESS.

THE CHAIRMAN: My Lords and Gentlemen, You will find the chief events of the year 1934 duly recorded in the Annual Report, but if you will spare me a moment I should like to refer to one or two of the more important of them.

H.R.H. The Duke of York paid a visit here in December last and went round the Museum, and every year since the King and Queen came here in our Centenary Year (1931) we have been honoured by Royal visits. We have received gracious gifts to the Museum from Her Majesty the Queen, the Prince of Wales and the Princess Royal. In connection with the Museum there have been special Exhibitions during the year, one of a Military character, one of a Naval character and one of an Air Force character. I think you will agree with me, therefore, that we are living up to our title of "The Royal United Service Institution."

The Finance Section of the Report shows a small balance on the right side on the year's working, and the Chairman of the Finance Committee will be prepared to answer any questions on details which you may like to ask him. You will note with gratitude the generous bequest that we received from the late Colonel Ashburner. Part of this has been put to the very good purpose of restoring some of our more valuable pictures, and of providing a case for the new Library catalogue and a stand for our autograph letters. The Council felt that it was desirable to improve the Library. The re-cataloguing of the books has been carried out by an expert, and an Assistant Librarian has replaced the Senior Library Clerk. Under the Librarian, this new Officer of the Institution will be particularly responsible for the Lending Library, and it is hoped that this arrangement will be for the benefit of Members. It is a matter for regret that it seems not to be sufficiently well known in the Services that it is a real economy to officers, especially young officers, to join the Institution and so be able to borrow all the professional books that they want, wherever they may be stationed, instead of having to buy these books and carry them about the world for themselves. I hope they will get to know of this.

Our congratulations are due to the Chairman of the Journal Committee, Admiral Sir Reginald Tupper, and of the Museum Committee, Colonel Colvin, for the increased prosperity of their respective departments. I would like to add a word of recognition of the debt we owe to our Secretary and Editor – Captain Altham, and to our Librarian and Curator – Colonel Hughes, for their services, and to the staff of the Institution in general for their unstinted and unremitting labours on its behalf.

I now propose:

> "That the Report and Accounts as circulated, be taken as read and adopted."

THE CHAIRMAN OF THE FINANCE COMMITTEE: I have much pleasure in seconding the Resolution. The Financial Report is so fully set out that I do not think any comment on it from me is necessary.

No questions being asked on the Report and Accounts, the Resolution was put and carried unanimously.

RE-ELECTION OF AUDITORS.

CAPTAIN C. G. T. DEAN: I propose:—

"That Messrs. Barton, Mayhew & Co. be re-elected Auditors for the ensuing year at a fee of fifty guineas."

CAPTAIN K. R. WILSON: I have much pleasure in seconding the resolution.

The Resolution was put and carried unanimously.

VACANCIES ON THE COUNCIL.

THE CHAIRMAN: There are vacancies on the Council as detailed on the Agenda. As there have been no new nominations from outside, the Council have nominated those who are now serving on the Council for re-election. Will you allow me to put it from the Chair that the following nominations be approved *en bloc*? (*Agreed.*)

ROYAL NAVY (1 *vacancy*).

Rear-Admiral B. W. M. Fairbairn, C.B.E.

ROYAL MARINES (1 *vacancy*).

Brigadier W. W. Godfrey, C.B., C.M.G., A.D.C.

ROYAL NAVAL VOLUNTEER RESERVE (1 *vacancy*).

Commodore the Earl Howe, C.B.E., V.D.

REGULAR ARMY (2 *vacancies*).

Colonel G. E. C. Rasch, D.S.O.
General Sir Robert Whigham, G.C.B., K.C.M.G., D.S.O.

TERRITORIAL ARMY (2 *vacancies*).

Colonel F. D. Samuel, D.S.O., T.D.
Colonel B. Abel Smith, D.S.O., M.C., T.D., A.D.C.

THE GOLD MEDAL ESSAY (NAVAL), 1934.

THE CHAIRMAN: The subject set for the Gold Medal Essay Competition for 1934 was a naval one, namely, "To consider in all its aspects the minimum size of the capital ship demanded by modern conditions of warfare." There were seventeen entries, and both as regards the interest aroused and the standard of the essays the competition has been particularly valuable—all the more so because the battleship question is one which is likely to come into considerable prominence in the not very distant future. The Referees had some little difficulty in arriving at a decision as to the besy essays, but they are unanimous in their recommendations as regards the first and second prize-winners. The Council are therefore presenting the Gold Medal of the Institution and the first Trench Gascoigne Prize of £30 to Lieutenant G.M. Bennett, R.N.

(The Chairman handed the Medal and Prize to Lieutenant Bennett amidst applause.)

They have awarded the second Trench Gascoigne Prize of 20 guineas to Lieutenant-Commander P. H. S. Reid, R.N.

(The Chairman handed the Prize to Lieutenant-Commander Reid amidst applause.)

In view of the large number of entries and the reports of the Referees, the Council have approved the award of a joint third prize of 10 guineas each to Commander Carlyon Bellairs, R.N., and Lieutenant-Commander P. W. Brock, R.N.

(The Chairman handed the Prize to Lieutenant-Commander Brock amidst applause. The Chairman announced that Commander Carlyon Bellairs was abroad.)

VOTE OF THANKS TO THE RETIRING CHAIRMAN.

ADMIRAL SIR WILLIAM E. GOODENOUGH, G.C.B., M.V.O.: On behalf not only of this comparatively small meeting but of the whole Institution I have much pleasure in proposing "That the thanks of the Institution be accorded to you, Sir, the retiring Chairman." It is perhaps one of our great assets that each succeeding Chairman of our Council, whether he be a soldier, a naval or an air officer, carries on a continuous policy of progress, freedom of speech without licence, and general dignity; and may I say, Sir, that you have carried out in every particular those qualities in a very marked degree. (Hear, hear.) You have been considerate on the Council to other people's opinions; you have heard what everybody has had to say; you have conducted our affairs with great dignity; and you have safeguarded our interests in every way. I therefore beg to propose this vote of thanks and that it be recorded on the minutes.

GENERAL SIR FELIX READY, K.C.B., C.S.I., C.M.G., D.S.O.: I have much pleasure in seconding the Resolution.

The Resolution was carried by acclamation.

THE CHAIRMAN: Sir William Goodenough, Sir Felix Ready, and Gentlemen. I thank you most warmly for the very kind terms in which you have proposed this resolution, and for the very generous way in which you have received it. I have thoroughly enjoyed my term of office, and my task has been a very easy one because of the kindly consideration and generous help I have at all times received from my colleagues on the Council and the Officers of the Institution. You, Sir William, are about to succeed me as Chairman of the Council for the coming year, and you, Sir Felix, are about to succeed Sir William as the Vice-Chairman. I can only hope—in fact I can extend to you no better wish—than that when your term of office is up you will have as pleasant memories of it as I have to-day. (Applause.)

That concludes our business.

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